MSI
MICRO-STAR INTERNATIONAL

K9N Neo V2/ V3 Series

MS-7369 (V1.X) Mainboard

G52-73691X1

Copyright Notice

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Revision History

Revision	Revision History	Date
V1.0	First release for PCB 1.X	June 2007

Technical Support

If a problem arises with your system and no solution can be obtained from the user's manual, please contact your place of purchase or local distributor. Alternatively, please try the following help resources for further guidance.

- Visit the MSI website for FAQ, technical guide, BIOS updates, driver updates, and other information: ***http://global.msi.com.tw/index.php?func=faqIndex***
- Contact our technical staff at: ***http://support.msi.com.tw/***

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by service personnel:
    - † The power cord or plug is damaged.
    - † Liquid has penetrated into the equipment.
    - † The equipment has been exposed to moisture.
    - † The equipment does not work well or you can not get it work according to User's Manual.
    - † The equipment has dropped and damaged.
    - † The equipment has obvious sign of breakage.
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

警告使用者:
這是甲類的資訊產品，在居住的環境中使用時，可能會造成無線電干擾，在這種情況下，使用者會被要求採取某些適當的對策。

廢電池請回收

For better environmental protection, waste batteries should be collected separately for recycling or special disposal.

FCC-B Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the measures listed below.

- † Reorient or relocate the receiving antenna.
- † Increase the separation between the equipment and receiver.
- † Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- † Consult the dealer or an experienced radio/television technician for help.

Notice 1

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International
MS-7369

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

WEEE (Waste Electrical and Electronic Equipment) Statement

ENGLISH

To protect the global environment and as an environmentalist, MSI must remind you that...

Under the European Union ("EU") Directive on Waste Electrical and Electronic Equipment, Directive 2002/96/EC, which takes effect on August 13, 2005, products of "electrical and electronic equipment" cannot be discarded as municipal waste anymore and manufacturers of covered electronic equipment will be obligated to take back such products at the end of their useful life. MSI will comply with the product take back requirements at the end of life of MSI-branded products that are sold into the EU. You can return these products to local collection points.

DEUTSCH

Hinweis von MSI zur Erhaltung und Schutz unserer Umwelt

Gemäß der Richtlinie 2002/96/EG über Elektro- und Elektronik-Altgeräte dürfen Elektro- und Elektronik-Altgeräte nicht mehr als kommunale Abfälle entsorgt werden. MSI hat europaweit verschiedene Sammel- und Recyclingunternehmen beauftragt, die in die Europäische Union in Verkehr gebrachten Produkte, am Ende seines Lebenszyklus zurückzunehmen. Bitte entsorgen Sie dieses Produkt zum gegebenen Zeitpunkt ausschliesslich an einer lokalen Altgerätesammelstelle in Ihrer Nähe.

FRANÇAIS

En tant qu'écologiste et afin de protéger l'environnement, MSI tient à rappeler ceci...

Au sujet de la directive européenne (EU) relative aux déchets des équipement électriques et électroniques, directive 2002/96/EC, prenant effet le 13 août 2005, que les produits électriques et électroniques ne peuvent être déposés dans les décharges ou tout simplement mis à la poubelle. Les fabricants de ces équipements seront obligés de récupérer certains produits en fin de vie. MSI prendra en compte cette exigence relative au retour des produits en fin de vie au sein de la communauté européenne. Par conséquent vous pouvez retourner localement ces matériels dans les points de collecte.

РУССКИЙ

Компания MSI предпринимает активные действия по защите окружающей среды, поэтому напоминаем вам, что....

В соответствии с директивой Европейского Союза (ЕС) по предотвращению загрязнения окружающей среды использованным электрическим и электронным оборудованием (директива WEEE 2002/96/EC), вступающей в силу 13 августа 2005 года, изделия, относящиеся к электрическому и электронному оборудованию, не могут рассматриваться как бытовой мусор, поэтому производители вышеперечисленного электронного оборудования обязаны принимать его для переработки по окончании срока службы. MSI обязуется соблюдать требования по приему продукции, проданной под маркой MSI на территории ЕС, в переработку по окончании срока службы. Вы можете вернуть эти изделия в специализированные пункты приема.

ESPAÑOL

MSI como empresa comprometida con la protección del medio ambiente, recomienda:

Bajo la directiva 2002/96/EC de la Unión Europea en materia de desechos y/o equipos electrónicos, con fecha de rigor desde el 13 de agosto de 2005, los productos clasificados como "eléctricos y equipos electrónicos" no pueden ser depositados en los contenedores habituales de su municipio, los fabricantes de equipos electrónicos, están obligados a hacerse cargo de dichos productos al termino de su período de vida. MSI estará comprometido con los términos de recogida de sus productos vendidos en la Unión Europea al final de su periodo de vida. Usted debe depositar estos productos en el punto limpio establecido por el ayuntamiento de su localidad o entregar a una empresa autorizada para la recogida de estos residuos.

NEDERLANDS

Om het milieu te beschermen, wil MSI u eraan herinneren dat....

De richtlijn van de Europese Unie (EU) met betrekking tot Vervuiling van Electrische en Electronische producten (2002/96/EC), die op 13 Augustus 2005 in zal gaan kunnen niet meer beschouwd worden als vervuiling.

Fabrikanten van dit soort producten worden verplicht om producten retour te nemen aan het eind van hun levenscyclus. MSI zal overeenkomstig de richtlijn handelen voor de producten die de merknaam MSI dragen en verkocht zijn in de EU. Deze goederen kunnen geretourneerd worden op lokale inzamelingspunten.

SRPSKI

Da bi zaštitili prirodnu sredinu, i kao preduzeće koje vodi računa o okolini i prirodnoj sredini, MSI mora da vas podesti da...

Po Direktivi Evropske unije ("EU") o odbačenoj ekektronskoj i električnoj opremi, Direktiva 2002/96/EC, koja stupa na snagu od 13. Avgusta 2005, proizvodi koji spadaju pod "elektronsku i električnu opremu" ne mogu više biti odbačeni kao običan otpad i proizvođači ove opreme biće prinuđeni da uzmu natrag ove proizvode na kraju njihovog uobičajenog veka trajanja. MSI će poštovati zahtev o preuzimanju ovakvih proizvoda kojima je istekao vek trajanja, koji imaju MSI oznaku i koji su prodati u EU. Ove proizvode možete vratiti na lokalnim mestima za prikupljanje.

POLSKI

Aby chronić nasze środowisko naturalne oraz jako firma dbająca o ekologię, MSI przypomina, że...

Zgodnie z Dyrektywą Unii Europejskiej ("UE") dotyczącą odpadów produktów elektrycznych i elektronicznych (Dyrektywa 2002/96/EC), która wchodzi w życie 13 sierpnia 2005, tzw. "produkty oraz wyposażenie elektryczne i elektroniczne " nie mogą być traktowane jako śmieci komunalne, tak więc producenci tych produktów będą zobowiązani do odbierania ich w momencie gdy produkt jest wycofywany z użycia. MSI wypełni wymagania UE, przyjmując produkty (sprzedawane na terenie Unii Europejskiej) wycofywane z użycia. Produkty MSI będzie można zwracać w wyznaczonych punktach zbiorczych.

TÜRKÇE

Çevreci özelliğiyle bilinen MSI dünyada çevreyi korumak için hatırlatır:

Avrupa Birliği (AB) Kararnamesi Elektrik ve Elektronik Malzeme Atığı, 2002/96/EC Kararnamesi altında 13 Ağustos 2005 tarihinden itibaren geçerli olmak üzere, elektrikli ve elektronik malzemeler diğer atıklar gibi çöpe atılamayacak ve bu elektonik cihazların üreticileri, cihazların kullanım süreleri bittikten sonra ürünleri geri toplamakla yükümlü olacaktır. Avrupa Birliği'ne satılan MSI markalı ürünlerin kullanım süreleri bittiğinde MSI ürünlerin geri alınması isteği ile işbirliği içerisinde olacaktır. Ürünlerinizi yerel toplama noktalarına bırakabilirsiniz.

ČESKY

Záleží nám na ochraně životního prostředí - společnost MSI upozorňuje...

Podle směrnice Evropské unie ("EU") o likvidaci elektrických a elektronických výrobků 2002/96/EC platné od 13. srpna 2005 je zakázáno likvidovat "elektrické a elektronické výrobky" v běžném komunálním odpadu a výrobci elektronických výrobků, na které se tato směrnice vztahuje, budou povinni odebírat takové výrobky zpět po skončení jejich životnosti. Společnost MSI splní požadavky na odebírání výrobků značky MSI, prodávaných v zemích EU, po skončení jejich životnosti. Tyto výrobky můžete odevzdat v místních sběrnách.

MAGYAR

Annak érdekében, hogy környezetünket megvédjük, illetve környezetvédőként fellépve az MSI emlékezteti Önt, hogy ...

Az Európai Unió („EU") 2005. augusztus 13-án hatályba lépő, az elektromos és elektronikus berendezések hulladékairól szóló 2002/96/EK irányelve szerint az elektromos és elektronikus berendezések többé nem kezelhetőek lakossági hulladékként, és az ilyen elektronikus berendezések gyártói kötelessé válnak az ilyen termékek visszavételére azok hasznos élettartama végén. Az MSI betartja a termékvisszavétellel kapcsolatos követelményeket az MSI márkanév alatt az EU-n belül értékesített termékek esetében, azok élettartamának végén. Az ilyen termékeket a legközelebbi gyűjtőhelyre viheti.

ITALIANO

Per proteggere l'ambiente, MSI, da sempre amica della natura, ti ricorda che....

In base alla Direttiva dell'Unione Europea (EU) sullo Smaltimento dei Materiali Elettrici ed Elettronici, Direttiva 2002/96/EC in vigore dal 13 Agosto 2005, prodotti appartenenti alla categoria dei Materiali Elettrici ed Elettronici non possono più essere eliminati come rifiuti municipali: i produttori di detti materiali saranno obbligati a ritirare ogni prodotto alla fine del suo ciclo di vita. MSI si adeguerà a tale Direttiva ritirando tutti i prodotti marchiati MSI che sono stati venduti all'interno dell'Unione Europea alla fine del loro ciclo di vita. È possibile portare i prodotti nel più vicino punto di raccolta.

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Chapter 1
Getting Started

Thank you for choosing the K9N Neo V2/ V3 Series (MS-7369 v1.X) ATX mainboard. The K9N Neo V2/ V3 Series mainboards are based on **nVidia® nForce 520/ nForce 560** single chipset for optimal system efficiency. Designed to fit the advanced **AMD® Athlon 64X2/ Athlon 64 & Sempron** processor, the K9N Neo V2/ V3 Series deliver a high performance and professional desktop platform solution.

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Mainboard Specifications

Processor Support

- AMD® Athlon 64/ 64X2 & Sempron in the socket AM2 package
(For the latest information about CPU, please visit *http://global.msi.com.tw/index.php?func=cpuform*)

Supported FSB

- HyperTransport supporting speed up to 1 GHz (2000MT/s)

Chipset

- nVidia® nForce 520/ nForce 560 chipset

Memory Support

- DDR2 533/667/800 SDRAM (240pin/ non-ECC)
- 4 DDR2 DIMMs (8GB Max)
(For more information on compatible components, please visit *http://global.msi.com.tw/index.php?func=testreport)*

LAN

- Supports Giga LAN 10/100/1000 Fast Ethernet by Realtek RTL8111B/ RTL 8211BL (optional)

Audio

- Controlled by Realtek ALC888
- Supports 7.1 channels audio out
- Compliant with Azalia Spec

IDE

- 1 IDE port
- Supports Ultra DMA 66/100/133, PIO & Bus Master operation mode

SATA

- 4 SATA ports support 4 SATA devices
- Supports storage and data transfers at up to 300 MB/s

RAID

- SATA1~4 support RAID 0/ 1/ 0+1/ 5 or JBOD mode (RAID 5 mode only for MCP65GT)

Floppy

- 1 floppy port
- Supports 1 FDD with 360KB, 720KB, 1.2MB, 1.44MB and 2.88MB

Connectors

Back panel

- 1 PS/2 mouse port
- 1 PS/2 keyboard port
- 1 Serial port
- 1 Parallel port support SPP/EPP/ECP mode
- 4 USB 2.0 Ports
- 1 LAN jack
- 6 audio jacks

On-Board Pinheaders

- 3 USB 2.0 pin headers
- 1 Chassis Intrusion Switch pinheader
- 1 SPDIF-Out pinheader
- 1 Front Panel Audio pinheader
- 1 CD-In pinheader

Slots

- 1 PCI Express x 16 slot
- 2 PCI Express x 1 slots
- 3 PCI slots, support 3.3V/ 5V PCI bus Interface

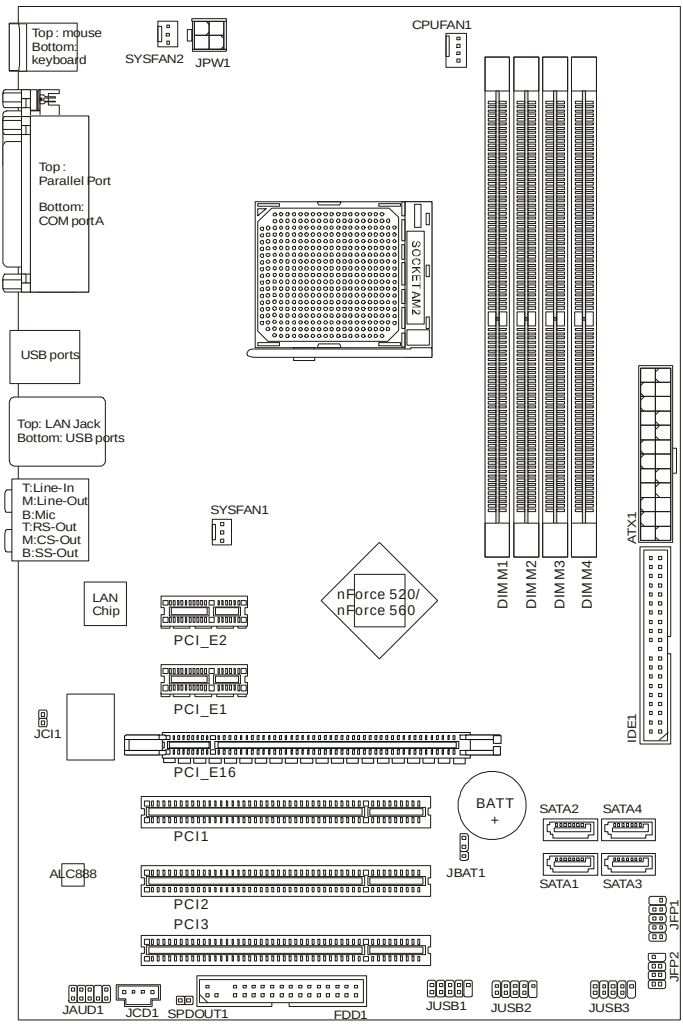
Form Factor

- ATX (30.5 cm X 20.0 cm)

Mounting

- 6 mounting holes

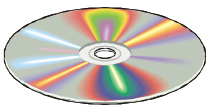
Mainboard Layout



K9N Neo V2/ K9N Neo V3 Series
(MS-7369 v1.X) ATX Mainboard

Packing Checklist

MSI motherboard



MSI Driver/Utility CD

Standard Cable for IDE Devices (Optional)

Power Cable

SATA Cable

Back IO Shield

User's Guide

* The pictures are for reference only and may vary from the packing contents of the product you purchased.

Chapter 2
Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

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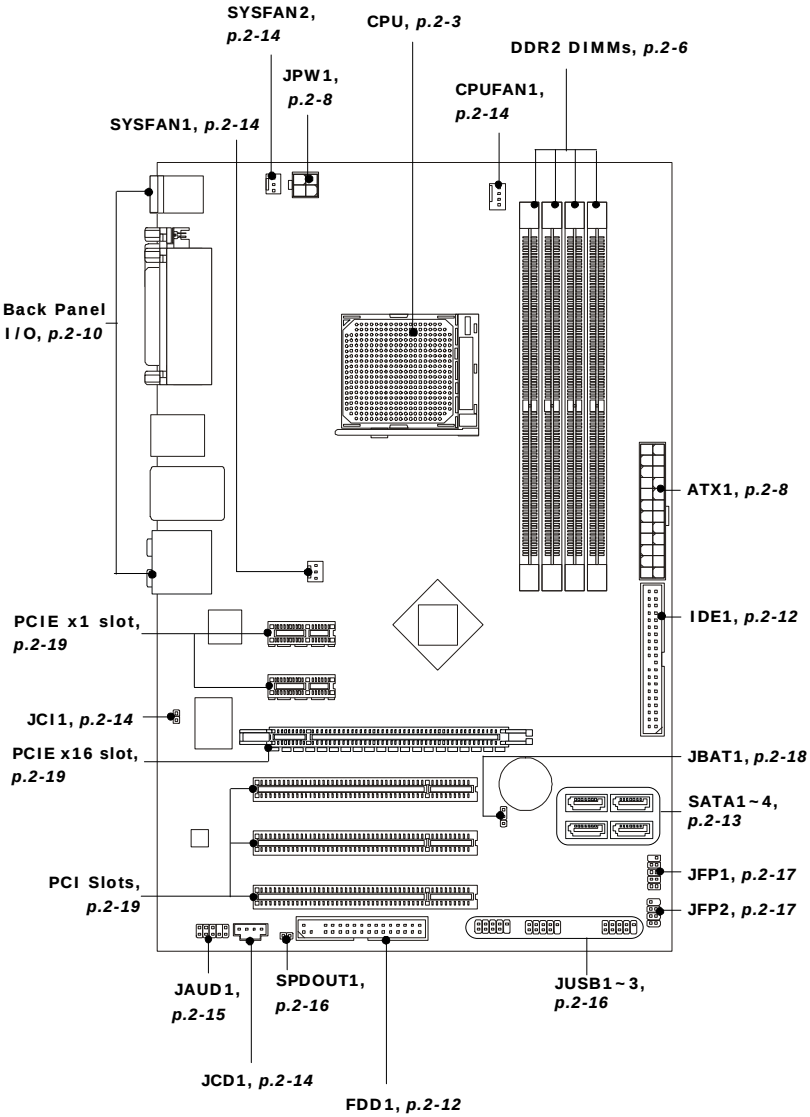
Quick Components Guide



CPU (Central Processing Unit)

The mainboard supports AMD® Athlon64/ 64x2 & Sempron processors. The mainboard uses a CPU socket called Socket AM2 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.
For the latest information about CPU, please visit http://global.msi.com.tw/index.php?func=cpuform

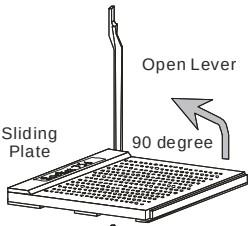
Important

Overheating
Overheating will seriously damage the CPU and system. Always make sure the cooling fan can work properly to protect the CPU from overheating. Make sure that you apply an even layer of thermal paste (or thermal tape) between the CPU and the heatsink to enhance heat dissipation.
Replaceing the CPU
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from the grounded outlet first to ensure the safety of CPU.
Overclocking
We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.

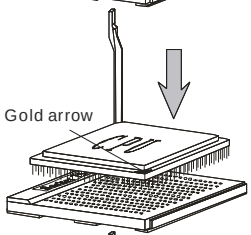
CPU Installation Procedures for Socket AM2

1. Please turn off the power and unplug the power cord before installing the CPU.

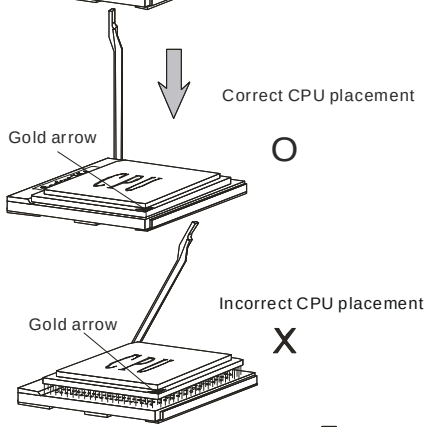
2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.



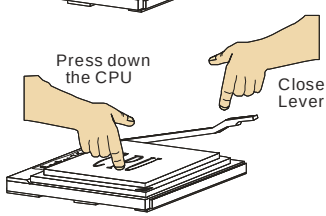
3. Look for the gold arrow of the CPU. The gold arrow should point as shown in the picture. The CPU can only fit in the correct orientation.



4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.



5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



Installing AMD Socket AM2 CPU Cooler Set

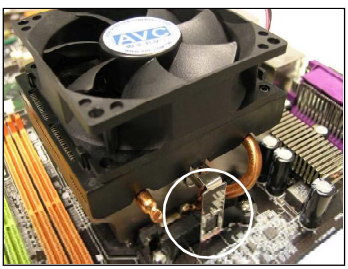
When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not have the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

Important

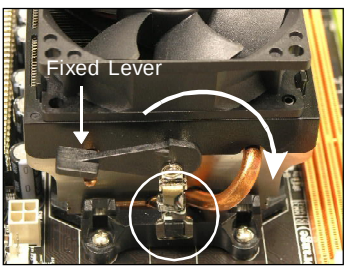
Mainboard photos shown in this section are for demonstration of the cooler installation for Socket AM2 CPUs only. The appearance of your mainboard may vary depending on the model you purchase.

1. Position the cooling set onto the retention mechanism.

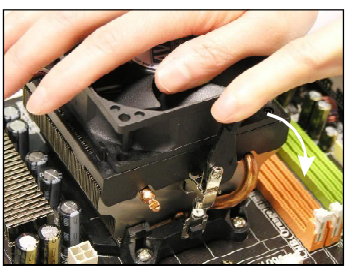
   Hook one end of the clip to hook first.



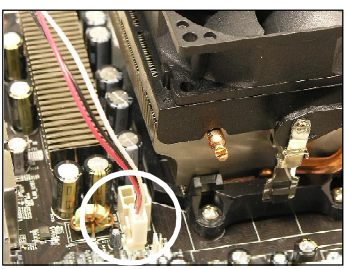
2. Then press down the other end of the clip to fasten the cooling set on the top of the retention mechanism. Locate the Fix Lever and lift up it .



3. Fasten down the lever.



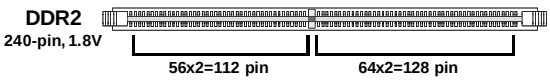
4. Attach the CPU Fan cable to the CPU fan connector on the mainboard.



Memory

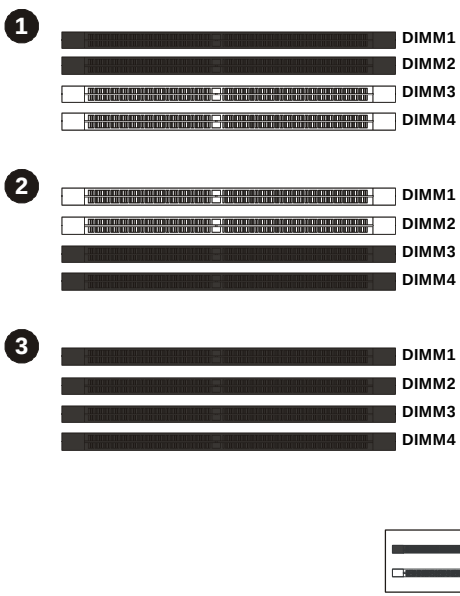
These DIMM slots are used for installing memory modules.

For more information on compatible components, please visit *http://global.msi.com.tw/index.php?func=testreport*



Dual-Channel mode Population Rule

In Dual-Channel mode, the memory modules can transmit and receive data with two data bus lines simultaneously. Enabling Dual-Channel mode can enhance the system performance. Please refer to the following illustrations for population rules under Dual-Channel mode.



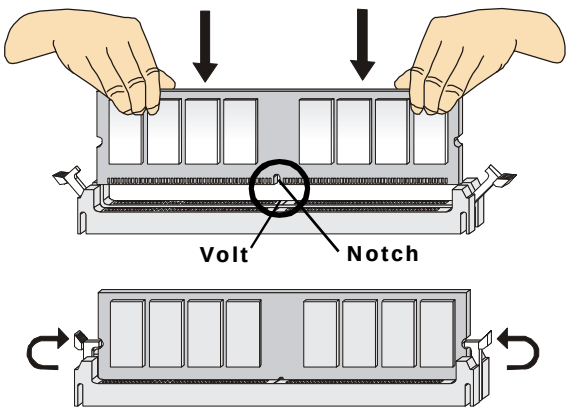
Installing Memory Modules

1. The memory module has only one notch on the center and will only fit in the right orientation.
2. Insert the memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the DIMM slot.

Important

You can barely see the golden finger if the memory module is properly inserted in the DIMM slot.

3. The plastic clip at each side of the DIMM slot will automatically close.



Important

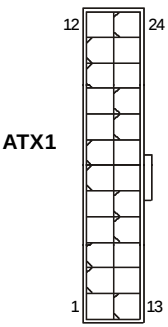
- *DDR2 memory modules are not interchangeable with DDR and the DDR2 standard is not backwards compatible. You should always install DDR2 memory modules in the DDR2 DIMM slots.*
- *In Dual-Channel mode, make sure that you install memory modules of **the same type and density** in different channel DIMM slots.*
- *To enable successful system boot-up, always insert the memory modules into the **DIMM1 first.***
- *Due to the chipset resource deployment, the system density will only be detected up to 7+GB (not full 8GB) when each DIMM is installed with a 2GB memory module.*

Power Supply

ATX 24-Pin Power Connector: ATX1

This connector allows you to connect an ATX 24-pin power supply. To connect the ATX 24-pin power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

You may use the 20-pin ATX power supply as you like. If you'd like to use the 20-pin ATX power supply, please plug your power supply along with pin 1 & pin 13 (refer to the image at the right hand). There is also a foolproof design on pin 11, 12, 23 & 24 to avoid wrong installation.



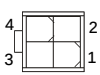
ATX1

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS-ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWROK	20	Res
9	5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

ATX 12V Power Connector: JPW1

This 12V power connector JPW1 is used to provide power to the CPU.



JPW1

Pin Definition

PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

Important

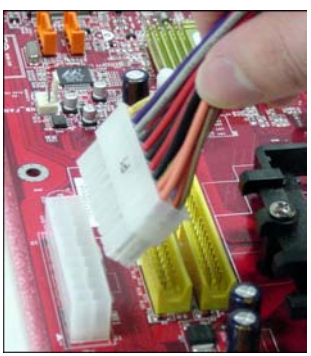
1. *Maker sure that all the connectors are connected to proper ATX power supplies to ensure stable operation of the mainboard.*
2. *Power supply of 350 watts (and above) is highly recommended for system stability.*

Important Notification about Power Issue

NForce chipset is very sensitive to ESD (Electrostatic Discharge), therefore this issue mostly happens while the users intensively swap memory modules under S5 (power-off) states, and the power code is plugged while installing modules. Due to several pins are very sensitive to ESD, so this kind of memory-replacement actions might cause system chipset unable to boot. Please follow the following solution to avoid this situation.

Unplug the AC power cable or unplug the power connectors before the 1st installation or during system upgrade procedure.

Unplug the AC power cable



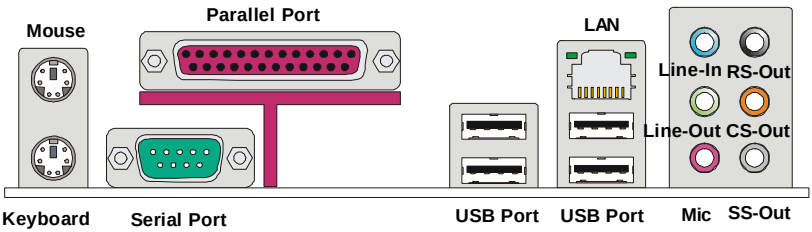
Unplug the power connector

Unplug the power connector

Important

Mainboard photos shown in this section are for demonstration only. The appearance of your mainboard may vary depending on the model you purchase.

Back Panel

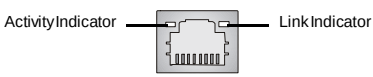


▶ Mouse/Keyboard Connector
The standard PS/2® mouse/keyboard DIN connector is for a PS/2® mouse/keyboard.

▶ Parallel Port Connector
A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

▶ Serial Port
The serial port is a 16550A high speed communications port that sends/ receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to the connector.

▶ LAN (RJ-45) Jack
The standard RJ-45 jack is for connection to single Local Area Network (LAN). You can connect a network cable to it.



LED	Color	LED State	condition
Left	Yelolow	Off	LAN link is not established.
		On (steady state)	LAN link is established.
		On (brighter & pulsing)	The computer is communicating with another computer on the LAN.
Right	Green	Off	10 Mbit/sec data rate is selected.
		On	100 Mbit/sec data rate is selected.
	Orange	On	1000 Mbit/sec data rate is selected.

▶ USB Port

The USB (Universal Serial Bus) port is for attaching USB devices such as keyboard, mouse, or other USB-compatible devices.

▶ Audio Ports

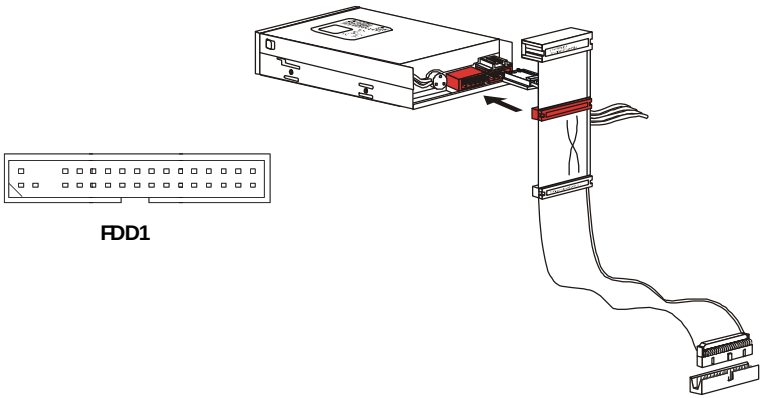
These audio connectors are used for audio devices. You can differentiate the color of the audio jacks for different audio sound effects.

- **Line-In (Blue)** - Line In, is used for external CD player, tapeplayer or other audio devices.
- **Line-Out (Green)** - Line Out, is a connector for speakers or headphones.
- **Mic (Pink)** - Mic, is a connector for microphones.
- **RS-Out (Black)** - Rear-Surround Out in 4/ 5.1/ 7.1 channel mode.
- **CS-Out (Orange)** - Center/ Subwoofer Out in 5.1/ 7.1 channel mode.
- **SS-Out (Gray)** - Side-Surround Out 7.1 channel mode.

Connectors

Floppy Disk Drive Connector: FDD1

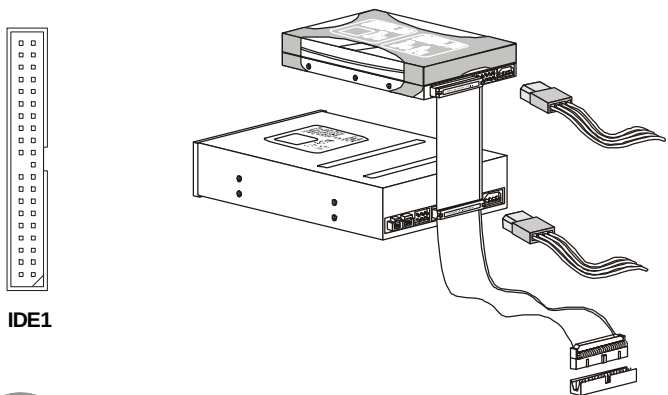
This connector supports 360KB, 720KB, 1.2MB, 1.44MB or 2.88MB floppy disk drive.



FDD1

IDE Connector: IDE1

This connector supports IDE hard disk drives, optical disk drives and other IDE devices.



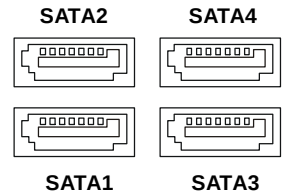
IDE1

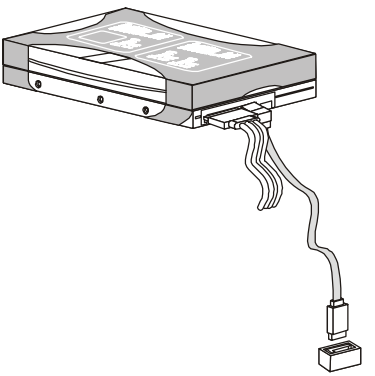
Important

If you install two IDE devices on the same cable, you must configure the drives separately to master / slave mode by setting jumpers. Refer to IDE device's documentation supplied by the vendors for jumper setting instructions.

Serial ATA Connector: SATA1/ SATA2/ SATA3/ SATA4

This connector is a high-speed Serial ATA interface port. Each connector can connect to one Serial ATA device.



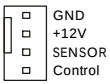


Important

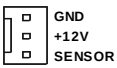
Please do not fold the Serial ATA cable into 90-degree angle. Otherwise, data loss may occur during transmission.

Fan Power Connectors: CPUFAN1, SYSFAN1, SYSFAN2

The fan power connectors support system cooling fan with +12V. When connecting the wire to the connectors, always note that the red wire is the positive and should be connected to the +12V; the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



CPUFAN1



SYSFAN1/2

Important

1. *Please refer to the recommended CPU fans at processor's official website or consult the vendors for proper CPU cooling fan.*
2. *Fan cooler set with 3 or 4 pins power connector are both available for CPUFAN1.*
3. *CPUFAN1 supports fan control. You can setup it in BIOS Setup. or CPUFAN1 supports fan control. You can install* ***Dual Core Center*** *utility that will automatically control the CPU fan speed according to the actual CPU temperature.*

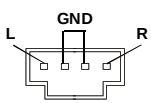
Chassis Intrusion Switch Connector: JCI1

This connector connects to the chassis intrusion switch cable. If the chassis is opened, the chassis intrusion mechanism will be activated. The system will record this status and show a warning message on the screen. To clear the warning, you must enter the BIOS utility and clear the record.

JCI1

CD-In Connector: JCD1

This connector is provided for external audio input.



JCD1

Front Panel Audio Connector: JAUD1

This connector allows you to connect the front panel audio and is compliant with Intel® Front Panel I/O Connectivity Design Guide.

JAUD1

HD Audio Pin Definition

PIN	SIGNAL	DESCRIPTION
1	MIC_L	Microphone - Left channel
2	GND	Ground
3	MIC_R	Microphone - Right channel
4	PRESENCE#	Active low signal-signals BIOS that a High Definition Audio dongle is connected to the analog header. PRESENCE# = 0 when a High Definition Audio dongle is connected
5	LINE out_R	Analog Port - Right channel
6	MIC_JD	Jack detection return from front panel microphone JACK1
7	Front_JD	Jack detection sense line from the High Definition Audio CODEC jack detection resistor network
8	NC	No control
9	LINE out_L	Analog Port - Left channel
10	LINEout_JD	Jack detection return from front panel JACK2

AC'97 Audio Pin Definition

PIN	SIGNAL	DESCRIPTION
1	MIC	Microphone input signal
2	GND	Ground
3	MIC_PWR	Microphone power
4	NC	No Control
5	LINE out_R	Right channel audio signal to front panel
6	NC	No Control
7	NC	No Control
8	Key	No pin
9	LINE out_L	Left channel audio signal to front panel
10	NC	No Control

Front USB Connector: JUSB1 / JUSB2 / JUSB3

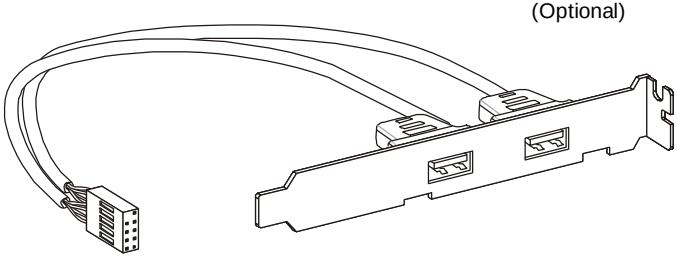
This connector, compliant with Intel® I/O Connectivity Design Guide, is ideal for connecting high-speed USB interface peripherals such as **USB HDD**, **digital cameras**, **MP3 players**, **printers**, **modems and the like**.

JUSB1/2/3

Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key(no pin)	10	USBOC

USB 2.0 Bracket
(Optional)

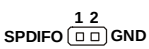


Important

Note that the pins of VCC and GND must be connected correctly to avoid possible damage.

S/PDIF-Out Connector: SPDOUT1 (for HDMI graphics card only)

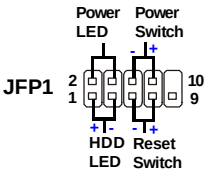
This connector is used to connect S/PDIF (Sony & Philips Digital Interconnect Format) interface for digital audio transmission **to the HDMI graphics card**.



SPDOUT1

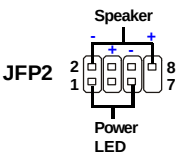
Front Panel Connectors: JFP1, JFP2

These connectors are for electrical connection to the front panel switches and LEDs. The JFP1 is compliant with Intel® Front Panel I/O Connectivity Design Guide.



JFP1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	HD_LED +	Hard disk LED pull-up
2	FP PWR/SLP	MSG LED pull-up
3	HD_LED -	Hard disk active LED
4	FP PWR/SLP	MSG LED pull-up
5	RST_SW -	Reset Switch low reference pull-down to GND
6	PWR_SW-	Power Switch high reference pull-down to GND
7	RST_SW +	Reset Switch high reference pull-up
8	PWR_SW+	Power Switch low reference pull-up
9	RSVD_DNU	Reserved. Do not use.



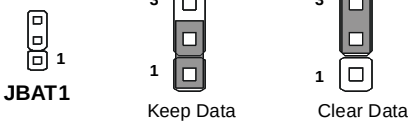
JFP2 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	GND	Ground
2	SPK-	Speaker-
3	SLED	Suspend LED
4	BUZ+	Buzzer+
5	PLED	Power LED
6	BUZ-	Buzzer-
7	NC	No connection
8	SPK+	Speaker+

Jumper

Clear CMOS Jumper: JBAT1

There is a CMOS RAM onboard that has a power supply from an external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, set the jumper to clear data.



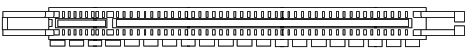
Important

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

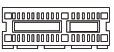
Slots

PCI (Peripheral Component Interconnect) Express Slot

The PCI Express slot supports the PCI Express interface expansion card.
The PCI Express x 16 supports up to 4.0 GB/s transfer rate.
The PCI Express x 8 supports up to 2.0 GB/s transfer rate.
The PCI Express x 4 supports up to 1.0 GB/s transfer rate.
The PCI Express x 1 supports up to 250 MB/s transfer rate.



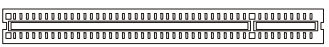
PCI Express x16 Slot



PCI Express x1 Slot

PCI (Peripheral Component Interconnect) Slot

The PCI slot supports LAN card, SCSI card, USB card, and other add-on cards that comply with PCI specifications.



32-bit PCI Slot

Important

When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to configure any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

PCI Interrupt Request Routing

The IRQ, acronym of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT W#	INT X#	INT Y#	INT Z#
PCI Slot 2	INT X#	INT Y#	INT Z#	INT W#
PCI Slot 3	INT Y#	INT Z#	INT W#	INT X#

Chapter 3
BIOS Setup

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.
You may need to run the Setup program when:

- An error message appears on the screen during the system booting up, and requests you to run SETUP.
- You want to change the default settings for customized features.

MSI
MICRO-STAR INTERNATIONAL

Entering Setup

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <DEL> key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

1. *The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.*
2. *Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format:*

A7369NMS V1.0 060107 where:

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX.
2nd - 5th digit refers to the model number.
6th digit refers to the chipset as I = Intel, N = nVidia, and V = VIA.
7th - 8th digit refers to the customer as MS = all standard customers.
V1.0 refers to the BIOS version.
060107 refers to the date this BIOS was released.

Control Keys

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F6>	Load Optimized Defaults
<F8>	Load Fail-Safe Defaults
<F10>	Save all the CMOS changes and exit

Getting Help

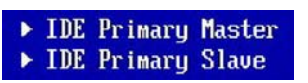
After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu

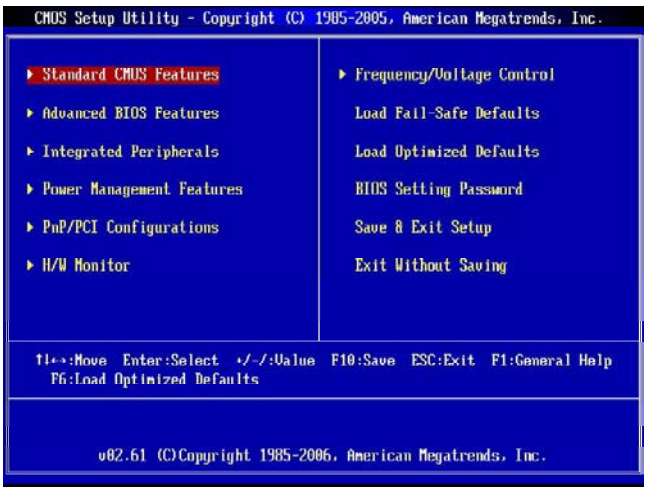
If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.



General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

The Main Menu



▶ Standard CMOS Features
Use this menu for basic system configurations, such as time, date etc.

▶ Advanced BIOS Features
Use this menu to setup the items of AMI® special enhanced features.

▶ Integrated Peripherals
Use this menu to specify your settings for integrated peripherals.

▶ Power Management Features
Use this menu to specify your settings for power management.

▶ PNP/PCI Configurations
This entry appears if your system supports PnP/PCI.

▶ H/W Monitor
This entry shows your PC health status.

▶ Frequency/Voltage Control
Use this menu to specify your settings for frequency/voltage control and overclocking.

▶ Load Fail-Safe Defaults
Use this menu to load the default values set by the BIOS vendor for stable system performance.

▶ Load Optimized Defaults
Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

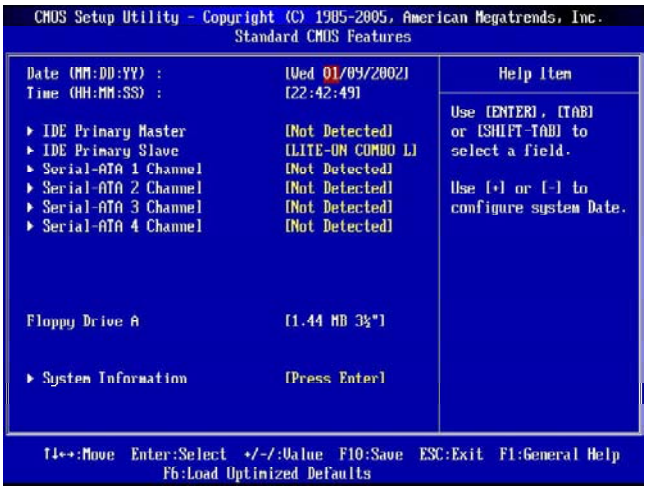
▶ BIOS Setting Password
Use this menu to set the password for BIOS.

▶ Save & Exit Setup
Save changes to CMOS and exit setup.

▶ Exit Without Saving
Abandon all changes and exit setup.

Standard CMOS Features

The items in Standard CMOS Features Menu includes some basic setup items. Use the arrow keys to highlight the item and then use the <PgUp> or <PgDn> keys to select the value you want in each item.


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Standard CMOS Features
Date (MM:DD:YY) : [Wed 01/09/2002]
Time (HH:MM:SS) : [22:42:49]
▸ IDE Primary Master [Not Detected]
▸ IDE Primary Slave [LITE-ON COMBO L]
▸ Serial-ATA 1 Channel [Not Detected]
▸ Serial-ATA 2 Channel [Not Detected]
▸ Serial-ATA 3 Channel [Not Detected]
▸ Serial-ATA 4 Channel [Not Detected]
Floppy Drive A [1.44 MB 3½"]
▸ System Information [Press Enter]
Help Item
Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system Date.
↑↓→←:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults

▶ Date (MM:DD:YY)

This allows you to set the system to the date that you want (usually the current date). The format is <day><month> <date> <year>.

day	Day of the week, from Sun to Sat, determined by BIOS. Read-only.
month	The month from Jan. through Dec.
date	The date from 1 to 31 can be keyed by numeric function keys.
year	The year can be adjusted by users.

▶ Time (HH:MM:SS)

This allows you to set the system time that you want (usually the current time). The time format is <hour> <minute> <second>.

▶ IDE Primary Master/ Slave & Serial-ATA1~4

Press <Enter> to enter the sub-menu, and the following screen appears.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
IDE Primary Master
IDE Primary Master
Device :Hard Disk
Vendor :ST340015ACE
Size :40.0GB
LBA/Large Mode [Auto]
DMA Mode [Auto]
Hard Disk S.M.A.R.T. [Auto]
Help Item
Disabled: Disables LBA Mode.
Auto: Enables LBA Mode if the device supports it and the device is not already formatted with LBA

▶ Device/ Vendor/ Size
It will showing the device information that you connected to the IDE/SATA connectors.

▶ LBA/Large Mode
This allows you to enable or disable the LBA Mode. Setting to Auto enables LBA mode if the device supports it and the devices is not already formatted with LBA mode disabled.

▶ DMA Mode
Select DMA Mode.

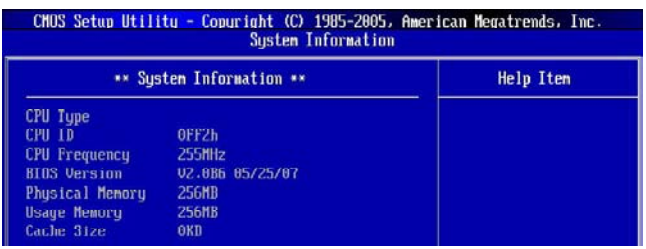
▶ Hard Disk S.M.A.R.T.
This allows you to activate the S.M.A.R.T. (Self-Monitoring Analysis & Reporting Technology) capability for the hard disks. S.M.A.R.T. is a utility that monitors your disk status to predict hard disk failure. This gives you an opportunity to move data from a hard disk that is going to fail to a safe place before the hard disk becomes offline.

Important

IDE Primary Master/ Slave & Serial-ATA1~4 *are appearing when you connect the HD devices to the SATA connector on the mainboard.*

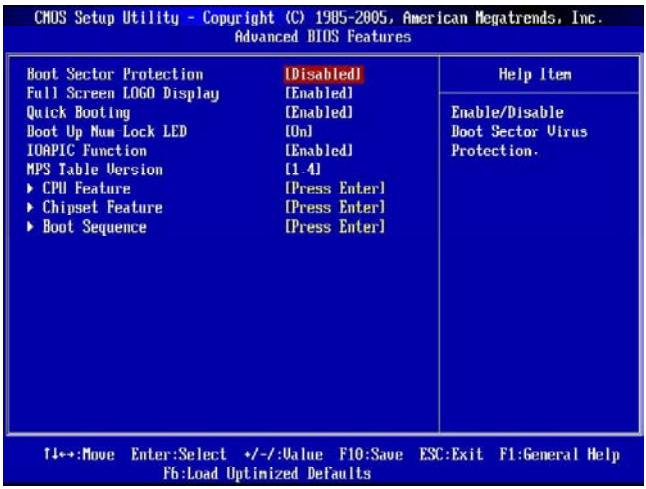
▶ Floppy Drive A
This item allows you to set the type of floppy drives installed. Available options: [None], [360K, 5.25 in.], [1.2M, 5.25 in.], [720K, 3.5 in.], [1.44M, 3.5 in.], [2.88M, 3.5 in.].

▶ System Information
Press <Enter> to enter the sub-menu, and the following screen appears.



This sub-menu shows the CPU information, BIOS version and memory status of your system (read only).

Advanced BIOS Features


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Advanced BIOS Features
Boot Sector Protection [Disabled]
Full Screen LOGO Display [Enabled]
Quick Booting [Enabled]
Boot Up Num-Lock LED [On]
IOAPIC Function [Enabled]
MPS Table Version [1.4]
CPU Feature [Press Enter]
Chipset Feature [Press Enter]
Boot Sequence [Press Enter]
Help Item
Enable/Disable Boot Sector Virus Protection.
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults

▶ Boot Sector Protection

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS' data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you'll need to disable this Flash BIOS Protection function.

You should enable this function at all times. The only time when you need to disable it is when you want to update the BIOS. After updating the BIOS, you should immediately re-enable it to protect it against viruses.

▶ Full Screen LOGO Display

This item enables you to show the company logo on the bootup screen. Settings are:

[Enabled]	Shows a still image (logo) on the full screen at boot.
[Disabled]	Shows the POST messages at boot.

▶ Quick Booting

Setting the item to [Enabled] allows the system to boot within 10 seconds since it will skip some check items.

▶ Boot Up Num-Lock LED

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

▶ IOAPIC Function

This field is used to enable or disable the APIC (Advanced Programmable Interrupt Controller). Due to compliance with PC2001 design guide, the system is able to run in APIC mode. Enabling APIC mode will expand available IRQ resources for the system.

▶ MPS Table Version
This field allows you to select which MPS (Multi-Processor Specification) version to be used for the operating system. You need to select the MPS version supported by your operating system. To find out which version to use, consult the vendor of your operating system.

▶ CPU Feature
Press <Enter> to enter the sub-menu and the following screen appears:

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
CPU Feature
Set Limit CPUID MaxVal to 3
[Disabled]
Help Item

▶ Set Limit CPUID MaxVal to 3
The Max CPUID Value Limit is designed to limit the listed speed of the processor to older operating systems.

▶ Chipset Feature
Press <Enter> to enter the sub-menu and the following screen appears:

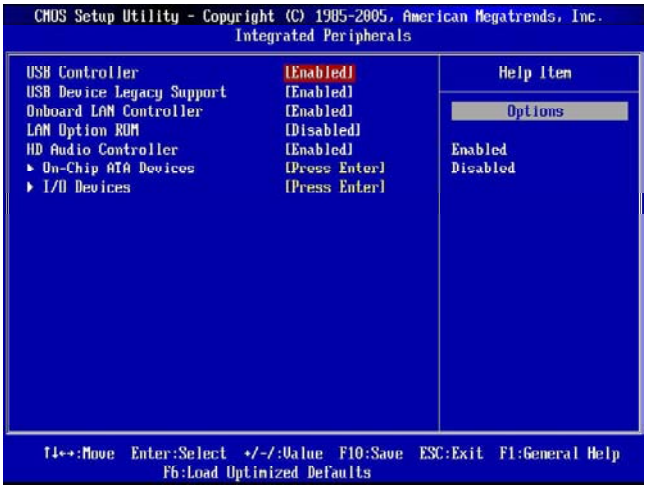
▶HPET
The HPET (High Precision Event Timers) is a component that is part of the chipset. You can to enable it, and will provide you with the means to get to it via the various ACPI methods.

▶ Boot Sequence
Press <Enter> to enter the sub-menu and the following screen appears:

▶ 1st/ 2nd/ 3rd Boot Device
The items allow you to set the first/ second/ third boot device where BIOS attempts to load the disk operating system.

▶ Boot From Other Device
Setting the option to [Yes] allows the system to try to boot from other device. if the system fails to boot from the 1st/ 2nd/ 3rd boot device.

Integrated Peripherals



▶ USB Controller
This setting allows you to enable/disable the onboard USB controller.

▶ USB Device Legacy Support
Select [Enabled] if you need to use a USB-interfaced device in the operating system.

▶ Onboard LAN Controller
This item is used to enable/disable the onboard LAN controller.

▶ LAN Option ROM
This item is used to decide whether to invoke the Boot ROM of the LAN controller.

▶ HD Audio Controller
This setting is used to enable/disable the onboard audio controller.

▶ On-Chip ATA Devices
Press <Enter> to enter the sub-menu and the following screen appears:

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
On-Chip ATA Devices
On-Chip IDE Controller [Enabled]
PCI IDE BusMaster [Disabled]
On-Chip SATA Controller [Enabled]
RAID mode [IDE]
Help Item
DISABLED: disables the integrated IDE

▶ On-Chip IDE Controller
This item allows you to enable/ disable the IDE controller.

▶ PCI IDE BusMaster
This item allows you to enable/ disable BIOS to used PCI busmastering for reading/ writing to IDE drives.

▶ On-Chip SATA Controller
This item allows you to enable/ disable the SATA controller.

▶ RAID mode
Select [RAID] will enable RAID function. Select [AHCI] to enable the AHCI (Advanced Host Contoller Interface) function. Select [IDE] to configure the SATA device as IDE device and without AHCI fucntion.

▶ I/O Devices
Press <Enter> to enter the sub-menu and the following screen appears:

▶ COM Port 1
Select an address and corresponding interrupt for the first serial port.

▶ Parallel Port
There is a built-in parallel port on the on-board Super I/O chipset that provides Standard, ECP, and EPP features. It has the following options:

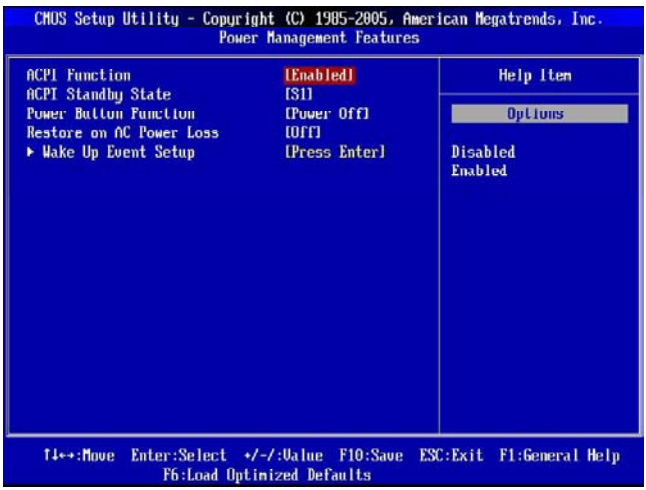
[Disabled]	
[3BC/IRQ7]	Line Printer port 0
[278/IRQ5]	Line Printer port 2
[378/IRQ7]	Line Printer port 1

▶ Parallel Port Mode

[Normal]	Stardand Parallel Port
[EPP]	Enhanced Parallel Port
[ECP]	Extended Capability Port
[Bi-Directional]	Extended Capability Port + Enhanced Parallel Port

To operate the onboard parallel port as Standard Parallel Port only, choose [Normal]. To operate the onboard parallel port in the EPP mode simultaneously, choose [EPP]. By choosing [ECP], the onboard parallel port will operate in ECP mode only. Choosing [Bi-Direction] will allow the onboard parallel port to support both the ECP and EPP modes simultaneously.

Power Management Setup


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Power Management Features
ACPI Function [Enabled]
ACPI Standby State [S1]
Power Button Function [Power Off]
Restore on AC Power Loss [Off]
▸ Wake Up Event Setup [Press Enter]
Help Item
Options
Disabled
Enabled
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults

Important

S3-related functions described in this section are available only when your BIOS supports S3 sleep mode.

▶ ACPI Function

This item is to activate the ACPI (Advanced Configuration and Power Management Interface) Function. If your operating system is ACPI-aware, such as Windows 2000/ XP, select [Enabled].

▶ ACPI Standby State

This item specifies the power saving modes for ACPI function. If your operating system supports ACPI, such as Windows 2000/ XP , you can choose to enter the Standby mode in S1(POS) or S3(STR) fashion through the setting of this field. Settings are:

[S1] The S1 sleep mode is a low power state. In this state, no system context is lost (CPU or chipset) and hardware maintains all system context.

[S3] The S3 sleep mode is a lower power state where the in formation of system configuration and open applications/files is saved to main memory that remains powered while most other hardware components turn off to save energy. The information stored in memory will be used to restore the system when a “wake up” event occurs.

▶ Power Button Function
This feature sets the function of the power button. Settings are:

[Power Off]	The power button functions as normal power off button.
[Suspend]	When you press the power button, the computer enters the suspend/sleep mode, but if the button is pressed for more than four seconds, the computer is turned off.

▶ Restore On AC Power Loss
This item specifies whether your system will reboot after a power failure or interrupt occurs. Settings are:

[Off]	Always leaves the computer in the power off state.
[On]	Always leaves the computer in the power on state.
[Last State]	Restores the system to the status before power failure or interrupt occurred.

▶ Wake Up Event Setup
Press <Enter> and the following sub-menu appears.

CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Wake Up Event Setup
Resume From S3 By PS/2 Keyboard [Disabled]
KeyBoard Password [Press Enter]
Resume From S3 By PS/2 Mouse [Disabled]
Resume By PCI Device (PME#) [Enabled]
Resume By PCI-E Device [Enabled]
Resume By RTC Alarm [Disabled]
Help Item
Any Key:
Support "On/OFF"
and "Suspend" for
Power Button mode.

▶ Resume From S3 By PS/2 Keyboard
This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 keyboard is detected.

▶ Resume From S3 By PS/2 Mouse
This setting determines whether the system will be awakened from what power saving modes when input signal of the PS/2 mouse is detected.

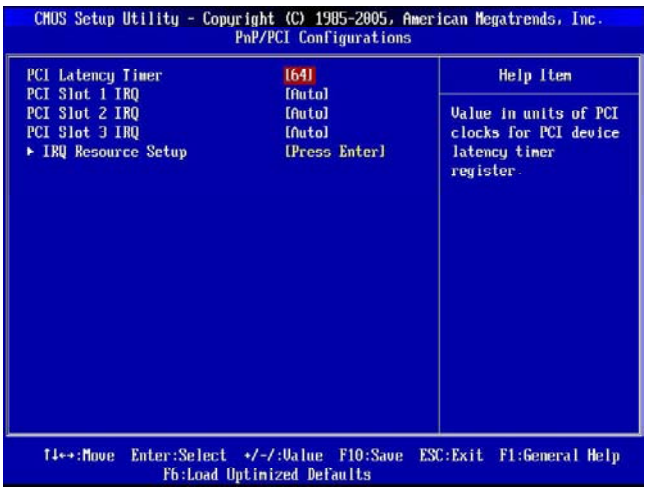
▶ Resume By PCI Device (PME#)
When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PME (Power Management Event).

▶ Resume By PCI-E Device
When set to [Enabled], the feature allows your system to be awakened from the power saving modes through any event on PCI Express device.

▶ Resume By RTC Alarm
The field is used to enable or disable the feature of booting up the system on a scheduled time/date.

PNP/PCI Configurations

This section describes configuring the PCI bus system and PnP (Plug & Play) feature. PCI, or **P**eripheral **C**omponent **I**nterconnect, is a system which allows I/O devices to operate at speeds nearing the speed the CPU itself uses when communicating with its special components. This section covers some very technical items and it is strongly recommended that only experienced users should make any changes to the default settings.


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
PnP/PCI Configurations
PCI Latency Timer [64]
PCI Slot 1 IRQ [Auto]
PCI Slot 2 IRQ [Auto]
PCI Slot 3 IRQ [Auto]
▸ IRQ Resource Setup [Press Enter]
Help Item
Value in units of PCI clocks for PCI device latency timer register.
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Uptimized Defaults

► PCI Latency Timer

This item controls how long each PCI device can hold the bus before another takes over. When set to higher values, every PCI device can conduct transactions for a longer time and thus improve the effective PCI bandwidth. For better PCI performance, you should set the item to higher values.

► PCI Slot 1/ 2/ 3 IRQ

These items specify the IRQ line for each PCI slot.

► IRQ Resource Setup

Press <Enter> to enter the sub-menu and the following screen appears.

► IRQ 3/4/5/7/9/10/11/14/15

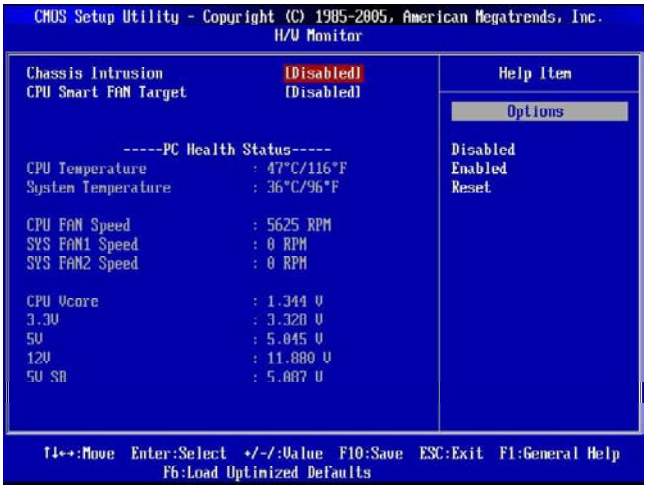
These items specify the bus where the specified IRQ line is used.

The settings determine if AMIBIOS should remove an IRQ from the pool of available IRQs passed to devices that are configurable by the system BIOS. The available IRQ pool is determined by reading the ESCD NVRAM. If more IRQs must be removed from the IRQ pool, the end user can use these settings to reserve the IRQ by assigning an [Reserved] setting to it. Onboard I/O is configured by AMIBIOS. All IRQs used by onboard I/O are configured as [Available]. If all IRQs are set to [Reserved], and IRQ 14/15 are allocated to the onboard PCI IDE, IRQ 9 will still be available for PCI and PnP devices.

Important

IRQ (Interrupt Request) lines are system resources allocated to I/O devices. When an I/O device needs to gain attention of the operating system, it signals this by causing an IRQ to occur. After receiving the signal, when the operating system is ready, the system will interrupt itself and perform the service required by the I/O device.

H/W Monitor


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
H/W Monitor
Chassis Intrusion [Disabled]
CPU Smart FAN Target [Disabled]
-----PC Health Status-----
CPU Temperature : 47°C/116°F
System Temperature : 36°C/96°F
CPU FAN Speed : 5625 RPM
SYS FAN1 Speed : 0 RPM
SYS FAN2 Speed : 0 RPM
CPU Vcore : 1.344 V
3.3V : 3.328 V
5V : 5.045 V
12V : 11.880 V
5V SB : 5.087 V
Help Item
Options
Disabled
Enabled
Reset
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Uptimized Defaults

▶ Chassis Intrusion
The field enables or disables the feature of recording the chassis intrusion status and issuing a warning message if the chassis is once opened. To clear the warning message, set the field to [Reset]. The setting of the field will automatically return to [Enabled] later.

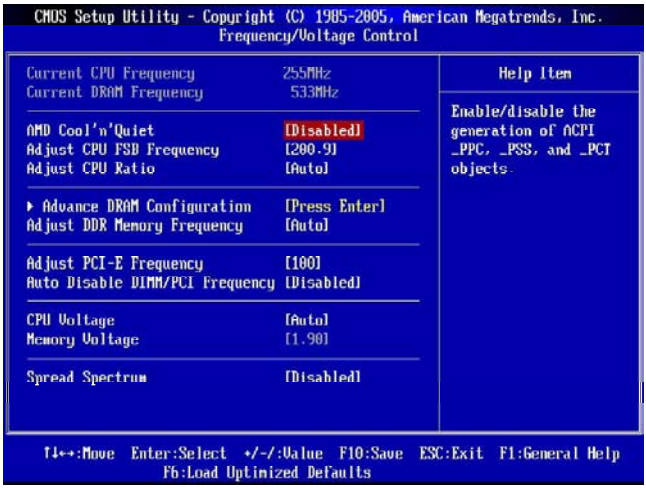
▶ CPU Smart FAN Target
The mainboard provides the Smart Fan function which can control the CPU fan speed automatically depending on the current temperature to keep it with in a specific range. You can select a fan target value here. If the current CPU fan temperature reaches to the target value, the smart fan function will be activated. It provides several sections to speed up for cooling down automaticlly.

▶ CPU Fan Tolerance Value
When a particular temperature setting is selected for the previous item, **CPU Smart Fan Target**, a temperature tolerance value between 1 to 5 can be adjusted here.

---- PC Health Status ----

▶ CPU/ System Temperature, CPU FAN/ SYS FAN1/ 2 Speed, CPU Vcore, 3.3V, 5V, 12V, 5V SB
These items display the current status of all of the monitored hardware devices/ components such as CPU voltage, temperatures and all fans' speeds.

Frequency/Voltage Control


CMOS Setup Utility - Copyright (C) 1985-2005, American Megatrends, Inc.
Frequency/Voltage Control
Current CPU Frequency 255MHz
Current DRAM Frequency 533MHz
AMD Cool'n'Quiet [Disabled]
Adjust CPU FSB Frequency [200.9]
Adjust CPU Ratio [Auto]
▸ Advance DRAM Configuration [Press Enter]
Adjust DDR Memory Frequency [Auto]
Adjust PCI-E Frequency [100]
Auto Disable DIMM/PCI Frequency [Disabled]
CPU Voltage [Auto]
Memory Voltage [1.90]
Spread Spectrum [Disabled]
Help Item
Enable/disable the generation of ACPI _PPC, _PSS, and _PCT objects.
↑↓↔:Move Enter:Select +/-/:Value F10:Save ESC:Exit F1:General Help
F6:Load Optimized Defaults

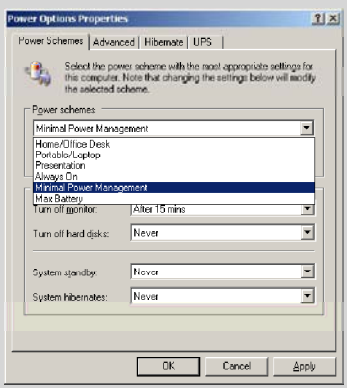
▶ Current CPU/ DRAM Frequency
These items show the current clocks of CPU and Memory speed. Read-only.

▶ AMD Cool'n'Quiet
The Cool'n' Quiet technology can effectively and dynamically lower CPU speed and power consumption.

Important

To ensure that Cool'n'Quiet function is activated and will be working properly, it is required to double confirm that:

1. *Run BIOS Setup, and select **Frequcncy/Voltage Control**. Under **Frequcncy/Voltage Control**, find **AMD Cool'n'Quiet**, and set this item to "Enable."*
2. *Enter Windows, and select [Start]->[Settings]->[Control Pannel]->[Power Options]. Enter **Power Options Properties** tag, and select **Minimal Power Management** under **Power schemes**.*



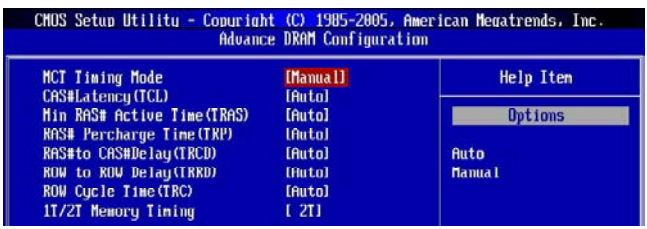
Important

Change these settings only if you are familiar with the chipset.

▶ Adjust CPU FSB Frequency
This item allows you to select the CPU Front Side Bus clock frequency (in MHz).

▶ Adjust CPU Ratio
This item allows you to set the CPU ratio.

▶ Advance DRAM Configuration
Press <Enter> to enter the sub-menu and the following screen appears.



▶ MCT Timing Mode
This field has the capacity to automatically detect all of the DRAM timing. If you set this field to [Manual], the following fields will be selectable.

▶ CAS# Latency (TCL)
When the ***MCT Timing Mode*** sets to [Manual], the field is adjustable.This controls the CAS latency, which determines the timing delay (in clock cycles) before SDRAM starts a read command after receiving it.

▶ Min RAS# Active Time (TRAS)
When the ***MCT Timing Mode*** sets to [Manual], the field is adjustable. This setting determines the time RAS takes to read from and write to a memory cell.

▶ RAS# Precharge Time (TRP)
When the ***MCT Timing Mode*** sets to [Manual], the field is adjustable. This item controls the number of cycles for Row Address Strobe (RAS) to be allowed to precharge. If insufficient time is allowed for the RAS to accumulate its charge before DRAM refresh, refreshing may be incomplete and DRAM may fail to retain data. This item applies only when synchronous DRAM is installed in the system.

▶ RAS# to CAS# Delay (TRCD)
When the ***MCT Timing Mode*** sets to [Manual], the field is adjustable. When DRAM is refreshed, both rows and columns are addressed separately. This setup item allows you to determine the timing of the transition from RAS (row address strobe) to CAS (column address strobe). The less the clock cycles, the faster the DRAM performance.

▶ **ROW to ROW Delay (TRRD)**
When the ***MCT Timing Mode*** sets to [Manual], the field is adjustable. Specifies the active-to-active delay of different banks.

▶ **ROW Cycle Time (TRC)**
When the ***MCT Timing Mode*** sets to [Manual], the field is adjustable. The row cycle time determines the minimum number of clock cycles a memory row takes to complete a full cycle, from row activation up to the precharging of the active row.

▶ **1T/2T Memory Timing**
This field controls the SDRAM command rate. Selecting [1T] makes SDRAM signal controller to run at 1T (T=clock cycles) rate. Selecting [2T] makes SDRAM signal controller run at 2T rate.

▶ **Adjust DDR Memory Frequency**
You can place an artificial memory clock limit on the system. Please note that memory is prevented from running faster than this frequency.

▶ **Adjust PCI-E Frequency**
This field allows you to select the PCIE frequency (in MHz).

▶ **Auto Disable DIMM/PCI Frequency**
This item is used to auto disable the DIMM/PCI slots. When set to [Enabled], the system will remove (turn off) clocks from empty DIMM/PCI slots to minimize the electromagnetic interference (EMI).

▶ **CPU Voltage**
This item allows you to increase the CPU voltage.

▶ **Memory Voltage**
Adjusting the memory voltage can increase the memory speed.

▶ **Spread Spectrum**
This setting is used to enable or disable the Spread Spectrum feature. When overclocking, always set it to [Disabled].

Important

1. *If you do not have any EMI problem, leave the setting at [Disabled] for optimal system stability and performance. But if you are plagued by EMI, select the value of Spread Spectrum for EMI reduction.*
2. *The greater the Spread Spectrum value is, the greater the EMI is reduced, and the system will become less stable. For the most suitable Spread Spectrum value, please consult your local EMI regulation.*
3. *Remember to disable Spread Spectrum if you are overclocking because even a slight jitter can introduce a temporary boost in clock speed which may just cause your overclocked processor to lock up.*

Load Fail-Safe/ Optimized Defaults

The two options on the main menu allow users to restore all of the BIOS settings to the default Fail-Safe or Optimized values. The Optimized Defaults are the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard. The Fail-Safe Defaults are the default values set by the BIOS vendor for stable system performance.

When you select Load Fail-Safe Defaults, a message as below appears:

Selecting ***Ok*** and pressing ***Enter*** loads the BIOS default values for the most stable, minimal system performance.

When you select Load Optimized Defaults, a message as below appears:

Selecting ***Ok*** and pressing ***Enter*** loads the default factory settings for optimal system performance.

BIOS Setting Password

When you select this function, a message as below will appear on the screen:

Type the password, up to six characters in length, and press <Enter>. The password typed now will replace any previously set password from CMOS memory. You will be prompted to confirm the password. Retype the password and press <Enter>. You may also press <Esc> to abort the selection and not enter a password.

To clear a set password, just press <Enter> when you are prompted to enter the password. A message will show up confirming the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup without entering any password.

When a password has been set, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from changing any part of your system configuration.

Appendix A
Realtek ALC888 Audio

The Realtek ALC888 provides 10-channel DAC that simultaneously supports 7.1 sound playback and 2 channels of independent stereo sound output (multiple streaming) through the Front-Out-Left and Front-Out-Right channels.

MSI
MICRO-STAR INTERNATIONAL

Installing the Realtek HD Audio Driver

You need to install the driver for Realtek ALC888 codec to function properly before you can get access to 2-, 4-, 6-, 8- channel or 7.1+2 channel audio operations. Follow the procedures described below to install the drivers for different operating systems.

Installation for Windows 2000/XP

For Windows® 2000, you must install Windows® 2000 Service Pack4 or later before installing the driver. For Windows® XP, you must install Windows® XP Service Pack1 or later before installing the driver.

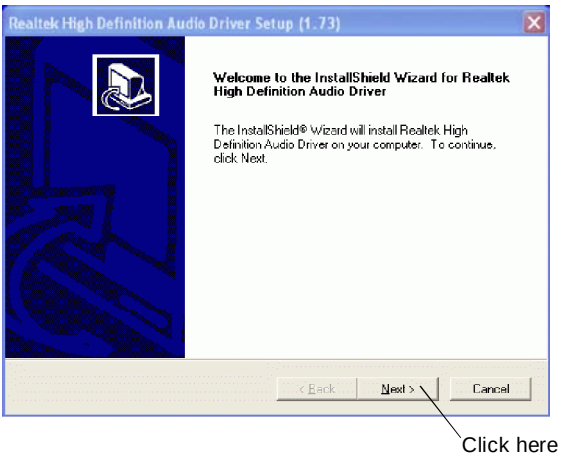
The following illustrations are based on Windows® XP environment and could look slightly different if you install the drivers in different operating systems.

1. Insert the application CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click **Realtek HD Audio Driver**.

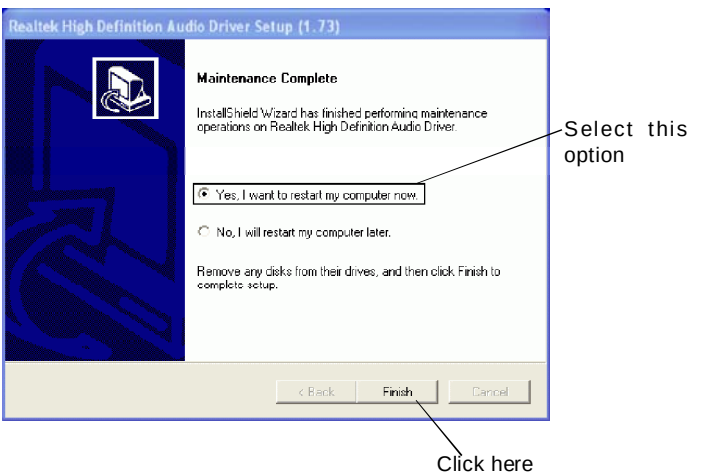
Important

*The **HD Audio Configuration** software utility is under continuous update to enhance audio applications. Hence, the program screens shown here in this section may be slightly different from the latest software utility and shall be held for reference only.*

3. Click **Next** to install the Realtek High Definition Audio Driver.


Realtek High Definition Audio Driver Setup (1.73)
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield® Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
< Back
Next >
Cancel
Click here

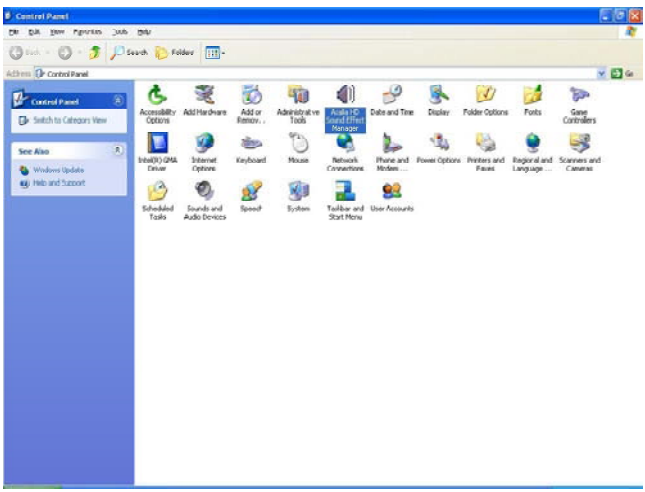
4. Click **Finish** to restart the system.


Realtek High Definition Audio Driver Setup (1.73)
Maintenance Complete
InstallShield Wizard has finished performing maintenance operations on Realtek High Definition Audio Driver.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
< Back
Finish
Cancel
Select this option
Click here

Software Configuration

After installing the audio driver, you are able to use the 2-, 4-, 6- or 8- channel audio feature now. Click the audio icon from the system tray at the lower-right corner of the screen to activate the **HD Audio Configuration**. It is also available to enable the audio driver by clicking the **Azalia HD Sound Effect Manager** from the **Control Panel**.

Double click



Sound Effect

Here you can select a sound effect you like from the **Environment** list.

Environment Simulation

You will be able to enjoy different sound experience by pulling down the arrow, totally 23 kinds of sound effect will be shown for selection. Realtek HD Audio Sound Manager also provides five popular settings “Stone Corridor”, “Bathroom”, “Sewer pipe”, “Arena” and “Audio Corridor” for quick enjoyment.

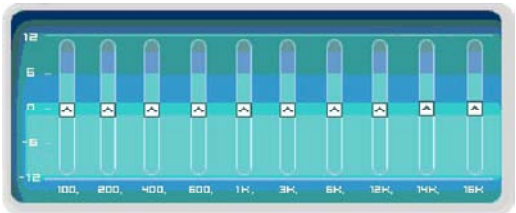
You may choose the provided sound effects, and the equalizer will adjust automatically. If you like, you may also load an equalizer setting or make an new equalizer setting to save as an new one by using the “**Load EQ Setting**” and “**Save Preset**” button, click “**Reset EQ Setting**” button to use the default value, or click “**Delete EQ Setting**” button to remove a preset EQ setting.

There are also other pre-set equalizer models for you to choose by clicking “**Others**” under the **Equalizer** part.

Equalizer Selection

Equalizer frees users from default settings; users may create their owned preferred settings by utilizing this tool.

10 bands of equalizer, ranging from 100Hz to 16KHz.



Save
The settings are saved permanently for future use

Reset
10 bands of equalizer would go back to the default setting

Enable / Disable
To disable, you can temporarily stop the sound effect without losing the settings

Load
Whenever you would like to use preload settings, simply click this, the whole list will be shown for your selection.

Delete
To delete the pre-saved settings which are created from previous steps.

Frequently Used Equalizer Setting

Realtek recognizes the needs that you might have. By leveraging our long experience at audio field, Realtek HD Audio Sound Manager provides you certain optimized equalizer settings that are frequently used for your quick enjoyment.

[How to Use It]

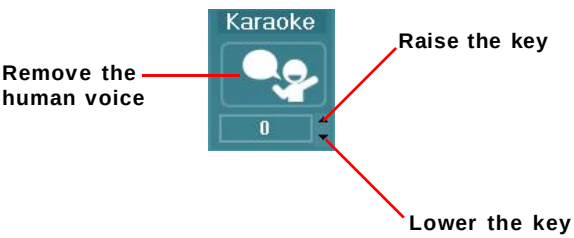
Other than the buttons “Pop” “Live” “Club” & “Rock” shown on the page, to pull down the arrow in “Others”, you will find more optimized settings available to you.

Karaoke Mode

Karaoke mode brings Karaoke fun back home. Simply using the music you usually play, Karaoke mode can help you eliminate the vocal of the song or adjust the key to accommodate your range.

1.Vocal Cancellation: Single click on “Voice Cancellation”, the vocal of the song would be eliminated, while the background music is still in place, and you can be that singer!

2.Key Adjustment: Using “Up / Down Arrow” to find a key which better fits your vocal range.



Mixer

In the **Mixer** part, you may adjust the volumes of the rear and front panels individually.

1. Adjust Volume

You can adjust the volume of the speakers that you pluged in front or rear panel.

Important

Before set up, please make sure the playback devices are well plugged in the jacks on the rear or front panel.

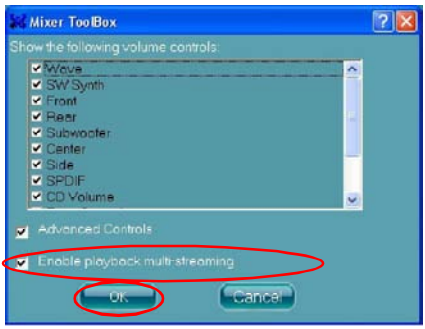
2. Multi-Stream Function

ALC888 supports an outstanding feature called Multi-Stream, which means you may play different audio sources simultaneously and let them output respectively from the indicated real panel or front panel. This feature is very helpful when 2 people are using the same computer together for different purposes.

Click the button and the Mixer **ToolBox** menu will appear. Then check the **Enable playback multi-streaming** and click **OK** to save the setup.

Important

You have to plug the device into the jacks on the rear and front panel first before enable the multi-stream function.



When you are playing the first audio source (for example: use Windows Media Player to play DVD/VCD), the output will be played from the rear panel, which is the default setting.

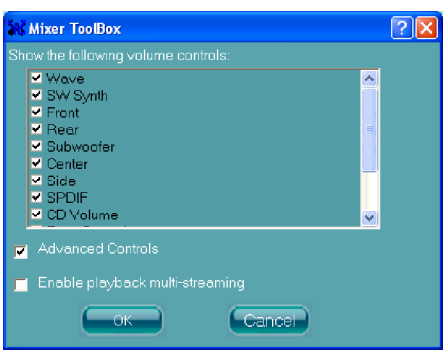
Then you **must** to select the **Realtek HD Audio 2nd output** from the scroll list **first**, and use a different program to play the second audio source (for example: use Winamp to play MP3 files). You will find that the second audio source (MP3 music) will come out from the Line-Out audio jack of Front Panel.

3. Playback control

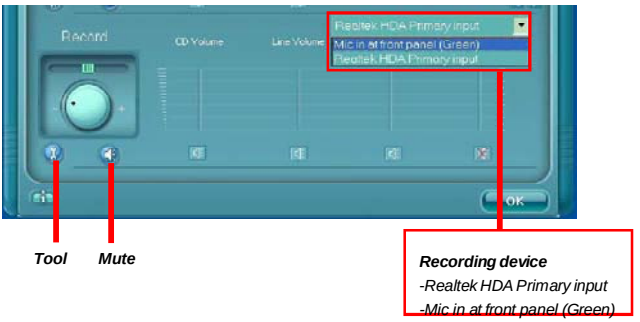
Playback device
This function is to let you freely decide which ports to output the sound. And this is essential when multi-streaming playback enabled.
- Realtek HD Audio Output
- Realtek HD Audio 2nd Output

Mute
You may choose to mute single or multiple volume controls or to completely mute sound output.

Tool
- Show the following volume controls
This is to let you freely decide which volume control items to be displayed.
- Advanced controls
- Enable playback multi-streaming
With this function, you will be able to have an audio chat with your friends via headphone (stream 1 from front panel) while still have music (stream 2 from back panel) in play. At any given period, you can have maximum 2 streams operating simultaneously.



4. Recording control



Mute
You may choose to mute single or multiple volume controls or to completely mute sound input.
Tool
- Show the following volume controls
This is to let you freely decide which volume control items to be displayed.
- Enable recording multi-streaming

Important

ALC888 allows you to record the CD, Line, Mic and Stereo Mix channels simultaneously, frees you from mixing efforts. At any given period, you may choose 1 of the following 4 channels to record.

Audio I/O

In this tab, you can easily configure your multi-channel audio function and speakers. You can choose a desired multi-channel operation here.

a. **Headphone** for the common headphone
b. **2CH Speaker** for Stereo-Speaker Output
c. **4CH Speaker** for 4-Speaker Output
d. **6CH Speaker** for 5.1-Speaker Output
e. **8CH Speaker** for 7.1-Speaker Output

Speaker Configuration:

1. Plug the speakers in the corresponding jack.

2. Dialogue “connected device” will pop up for your selection. Please select the device you have plugged in.
   - If the device is being plugged into the correct jack, you will be able to find the icon beside the jack changed to the one that is same as your device.
   - If not correct, Realtek HD Audio Manager will guide you to plug the device into the correct jack.

Connector Settings

Click to access connector settings.

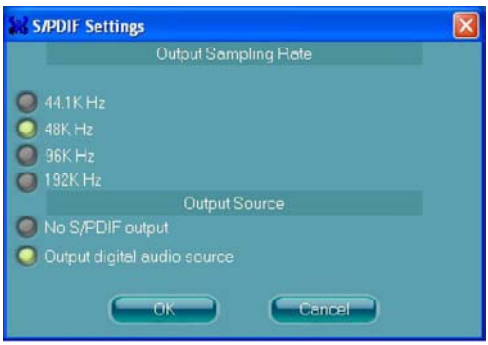
Connector Settings
Connector Settings
Disable front panel jack detection
Mute rear panel output when front headphone plugged in
Enable auto popup dialog, when device has been plugged in
OK
Cancel

Disable front panel jack detection (option)
Jack detection function only works with HD audio front panel.

Mute rear panel output when front headphone plugged in.

Enable auto popup dialogue, when device has been plugged in
Once this item checked, the dialog “Connected device” would automatically pop up when device plugged in.

S/PDIF (optional, for HDMI graphics card only)
Short for Sony/Philips Digital Interface, a standard audio file transfer format. S/PDIF allows the transfer of digital audio signals from one device to another without having to be converted first to an analog format. Maintaining the viability of a digital signal prevents the quality of the signal from degrading when it is converted to analog.

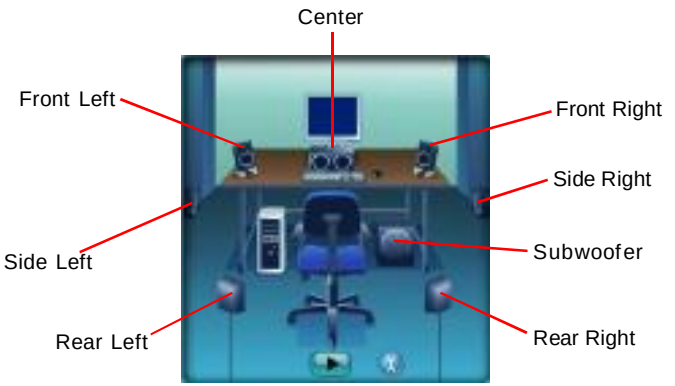


Output Sampling Rate
44.1KHz: This is recommend while playing CD.
48KHz: This is recommended while playing DVD or Dolby.
96KHz: This is recommended while playing DVD-Audio.
192KHz: This is recommended while playing High quality Audio.

Output Source
No S/PDIF out: There will no S/PDIF out.
Output digital audio source: The digital audio format (such as .wav, .mp3, .midi etc) will come out through S/PDIF-Out.

Test Speakers

You can select the speaker by clicking it to test its functionality. The one you select will light up and make testing sound. If any speaker fails to make sound, then check whether the cable is inserted firmly to the connector or replace the bad speakers with good ones. Or you may click the **auto test** button to test the sounds of each speaker automatically.



Microphone

In this tab you may set the function of the microphone. Select the **Noise Suppression** to remove the possible noise during recording, or select **Acoustic Echo Cancelltion** to cancel the acoustic echo druing recording.

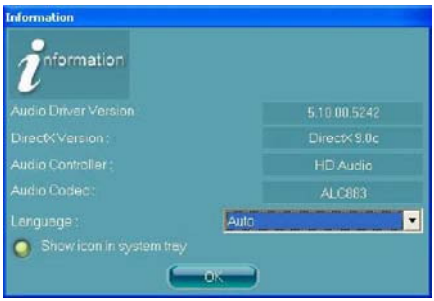
Acoustic Echo Cancelltion prevents playback sound from being recorded by microphone together with your sound. For example, you might have chance to use VOIP function through Internet with your friends. The voice of your friend will come out from speakers (playback). However, the voice of your friend might also be recorded into your microphone then go back to your friend through Internet. In that case, your friend will hear his/her own voice again. With AEC(Acoustic Echo Cancellation) enabled at your side, your friend can enjoy the benefit with less echo.

3D Audio Demo

In this tab you may adjust your 3D positional audio before playing 3D audio applications like gaming. You may also select different environment to choose the most suitable environment you like.

Information

In this tab it provides some information about this HD Audio Configuration utility, including Audio Driver Version, DirectX Version, Audio Controller & Audio Codec. You may also select the language of this utility by choosing from the **Language** list.



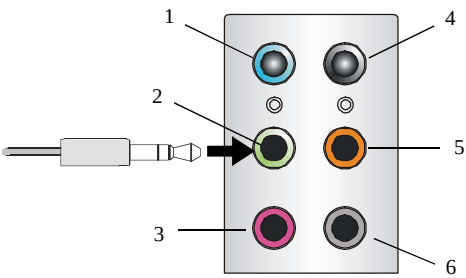
Also there is a selection **Show icon in system tray**. Switch it on and an icon will show in the system tray. Right-click on the icon and the **Audio Accessories** dialogue box will appear which provides several multimedia features for you to take advantage of.

Hardware Setup

Connecting the Speakers

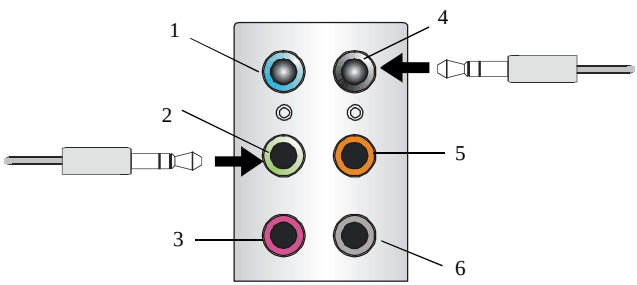
When you have set the Multi-Channel Audio Function mode properly in the software utility, connect your speakers to the correct phone jacks in accordance with the setting in software utility.

n 2-Channel Mode for Stereo-Speaker Output



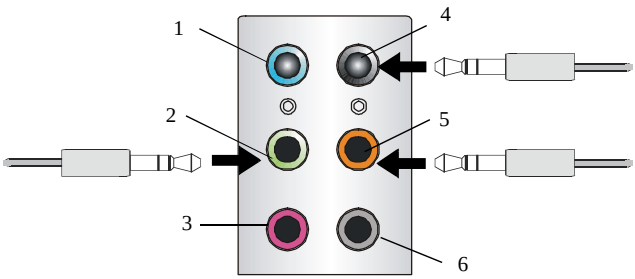
1. Line In
2. Line Out *(Front channels)*
3. MIC
4. No function
5. No function
6. No function

n 4-Channel Mode for 4-Speaker Output



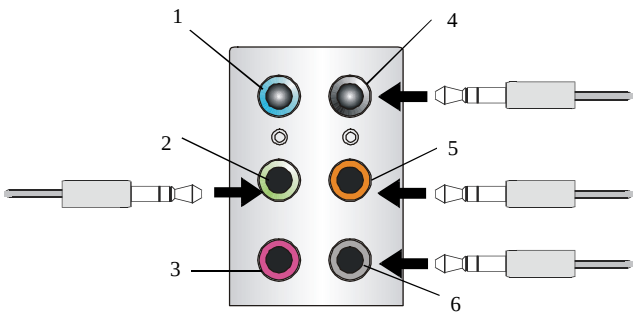
1 Line In
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels)*
5 No function
6 No function

n 6-Channel Mode for 6-Speaker Output



1 Line In
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels)*
5 Line Out *(Center and Subwoofer channel)*
6 No function

n 8-Channel Mode for 8-Speaker Output



1 Line In
2 Line Out *(Front channels)*
3 MIC
4 Line Out *(Rear channels)*
5 Line Out *(Center and Subwoofer channel)*
6 Line Out *(Side channels)*

Appendix B
nVidia RAID

NVIDIA brings Redundant Array of Independent Disks (RAID) technology—which is used by the world's leading businesses—to the common PC desktop. This technology uses multiple drives to either increase total disk space or to offer data protection. For all levels, RAID techniques optimize storage solutions by using multiple disks grouped together and treating them as a single storage resource.

MSI
MICRO-STAR INTERNATIONAL

Introduction

System Requirement

Operating System Support
NVRAID supports the following operating systems:
Windows XP/2000 & Vista

RAID Arrays

NVRAID supports the following types of RAID arrays described in this section:
RAID 0: RAID 0 defines a disk striping scheme that improves the disk read and write times for many applications.
RAID 1: RAID 1 defines techniques for mirroring data.
RAID 0+1: RAID 0+1 combines the techniques used in RAID 0 and RAID 1 arrays.
RAID 5: RAID 5 defines techniques for parity data.
Spanning (JBOD): JBOD provides a method for combining drives of different sizes into one large disk

Summary of RAID Configurations

Array	Uses	Advantages	Drawbacks	# Hard Disks	Fault Tolerance
RAID 0	Non-critical data requiring high performance.	High data throughput.	No fault tolerance.	multiple	None
RAID 1	Small databases or any other small capacity environment requiring fault tolerance.	100% data redundancy.	Requires 2 drives for the storage space of 1 drive.	2	Yes
RAID 0+1	Critical data requiring high performance.	Optimized for both 100% data redundancy and performance. Allows spare disks.	Requires 2 drives for the storage space of 1 drive—the same as RAID level 1.	4+	Yes
RAID 5	Critical data and reasonable level of performance.	Fault tolerance and better utilization of disk space.	Decreased write performance due to parity calculations. Requires at least three drives.	3+	Yes
JBOD	Combining odd size drives into one big drive	Combines and uses the capacity of odd size drives.	Decreases performance because of the difficulty in using drives concurrently or to optimize drives for different uses.	Multiple	No

RAID Configuration

Basic Configuration Instructions

The following are the basic steps for configuring NVRAID:

Non-Bootable RAID Array

1. Choose the hard disks that are to be RAID enabled in the system BIOS. (Refer the bios section for details.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), RAID 5 or JBOD and create the desired RAID array.
3. Enter the Windows OS, run the Windows nForce Setup application and install the RAID software. (Check p.B-9 for details.)
4. Initialize the NVRAID Array Disks.

Bootable RAID Array

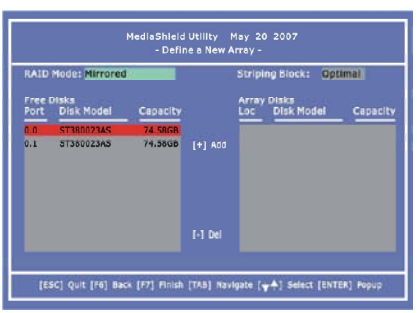
1. Choose the hard disks that are to be RAID enabled in the system BIOS.(Refer the bios section for details.)
2. Specify the RAID level, either Mirroring (RAID 1), Striping (RAID 0), Striping and Mirroring (RAID 0+1), RAID 5 or JBOD and create the desired RAID array.
3. Boot from the Windows CD, use the floppy disk that has the RAID driver to copy and install the nForce RAID software. (Check p.B-7 for details.)
4. Initialize the NVRAID Array Disks.

Setting Up the NVRAID BIOS

Be sure to enable the RAID mode for SATA devices in BIOS before configuring the NVRAID BIOS. After that press F10 to save the configuration and exit. The PC will reboot right away. Then enter the RAID BIOS Setup by pressing **F10** when prompted, and follow the procedures described below to set up the NVRAID BIOS.
NVRAID BIOS setup lets you choose the RAID array type and which hard drives you want to make part of the array.

Entering the RAID BIOS Setup

1. After rebooting your PC, wait until you see the RAID software prompting you to press **F10**. The RAID prompt appears as part of the system POST and boot process prior to loading the OS.
2. Press **F10**, and the NVIDIA RAID Utility --- **Define a New Array** window will appear.
   The default **RAID Mode** is set to ***Mirroring*** and **Striping Block** is set to ***Optimal***.



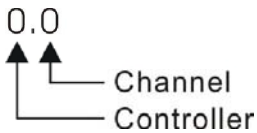
Understanding the "Define a New Array" Window

Use the Define a New Array window to

- Select the RAID Mode
- Set up the Striping Block
- Specify which disks to use for the RAID Array

Depending on the platform used, the system can have one or more channels. In a typical system there is usually one controller and multiple channels, and each channel has a slave and a master.

The channel/controller status of each hard disk is given in the Port columns of the Free Disks and Array Disks lists.



In the example above, 0.0 means the hard drive is attached to Controller 0, Channel 0. The following is a list of all possible combinations:

Serial ATA

0.0	Controller 0, Channel 0 (SATA1)
0.1	Controller 0, Channel 1 (SATA2)
0.2	Controller 0, Channel 2 (SATA3)
0.3	Controller 0, Channel 3 (SATA4)

Important

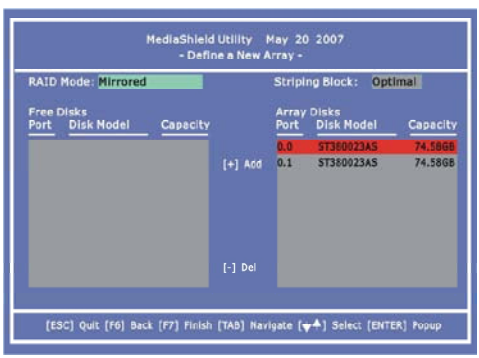
There is no such thing as Slave drive in Serial ATA. All drives are considered to be Master since there is a one to one connection between the drive and the controller.

Using the Define a New Array Window
If necessary, press the tab key to move from field to field until the appropriate field is highlighted.

• Selecting the RAID Mode
By default, this is set to [Mirroring]. To change to a different RAID mode, press the down arrow key until the mode that you want appears in the RAID Mode box—either [Mirroring], [Striping], [RAID5], [Spanning], or [Stripe Mirroring].

• Selecting the Striping Block Size
Striping Block size is given in kilobytes, and affects how data is arranged on the disk. It is recommended to leave this value at the default [Optimal], which is 32KB, but the values can be between [4 KB] and [128 KB].

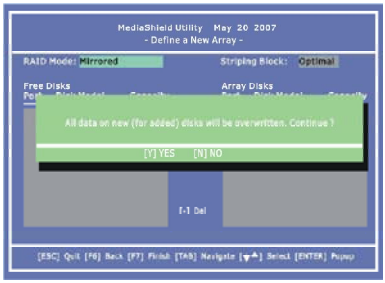
• Assigning the Disks
The disks that you enabled from the RAID Config BIOS setup page appear in the **Free Disks** block. These are the drives that are available for use as RAID array disks. To designate a free disk to be used as a RAID array disk,
1. Tab to the **Free Disks** section. The first disk in the list is selected.
2. Move it from the Free Disks block to the Array Disks block by pressing the right arrow key (-->). The first disk in the list is moved, and the next disk in the list is selected and ready to be moved.
3. Continue pressing the right-arrow key (<--) until all the disks that you want to use as RAID array disks appear in the **Array Disks** block.



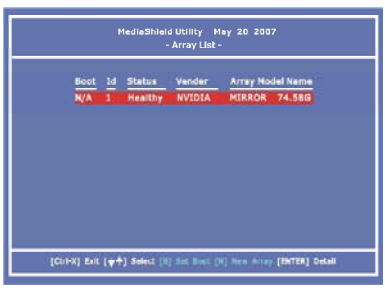
It shows that two disks have been assigned as RAID1 array disks in the figure above.

Completing the RAID BIOS Setup

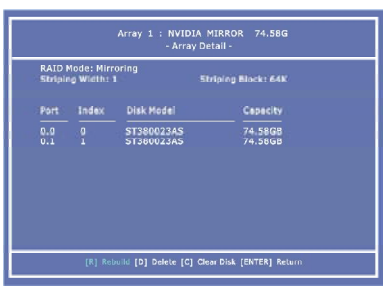
1. After assigning your RAID array disks, press **F7.** The Clear disk data prompt appears.


MediaShield Utility May 20 2007
- Define a New Array -
RAID Mode: Mirrored
Striping Block: Optimal
Free Disks
Array Disks
All data on new (for added) disks will be overwritten. Continue ?
[Y] YES [N] NO
[-] Del
[ESC] Quit [F6] Back [F7] Finish [TAB] Navigate [↑↓] Select [ENTER] Popup

2. Press **Y** if you want to wipe out all the data from the RAID array, otherwise press **N**. You must choose **Yes** if the drives were previously used as RAID drives. The **Array List** window appears, where you can review the RAID arrays that you have set up.


MediaShield Utility May 20 2007
- Array List -
Boot Id Status Vender Array Model Name
N/A 1 Healthy NVIDIA MIRROR 74.58G
[Ctrl+X] Exit [↑↓] Select [ENTER] Detail

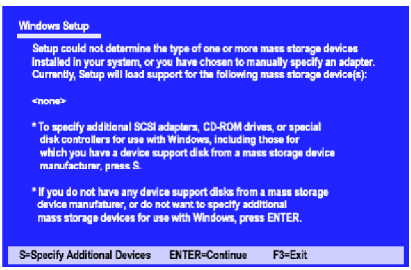
3. Use the arrow keys to select the array that you want to set up, then press **Enter.** The **Array Detail** window appears.


Array 1 : NVIDIA MIRROR 74.58G
- Array Detail -
RAID Mode: Mirroring
Striping Width: 1
Striping Block: 64K
Port Index Disk Model Capacity
0.0 0 ST380023AS 74.58GB
0.1 1 ST380023AS 74.58GB
[R] Rebuild [D] Delete [C] Clear Disk [ENTER] Return

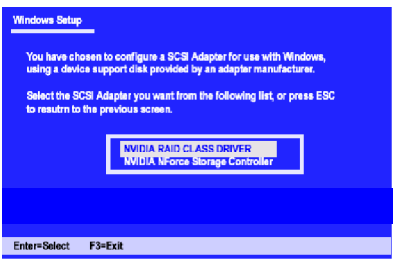
4. If you want to mark this disk as empty and wipe out all its contents then press **C**.
5. At the prompt, press **Y** to wipe out all the data, otherwise press **N**.
6. Press **Enter** again to go back to the previous window and then press **Ctrl+X** to exit the RAID setup. Now that the RAID setup has been configured from the RAID BIOS, the next step is to configure and load NVRAID drivers under Windows, as explained in “Installing the NVIDIA RAID Software Under Windows” on p.B-9.

Installing the RAID Driver (for bootable RAID Array)

1. After you complete the RAID BIOS setup, boot from the Windows CD, and the Windows Setup program starts.
2. Press **F6** and wait for the Windows Setup screen to appear.


Windows Setup
Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage device(s):
<none>
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Devices ENTER=Continue F3=Exit

3. Specify the NVIDIA drivers:
   (1) Insert the floppy that has the RAID driver, press S, then press Enter. The Windows Setup screen appears as below:

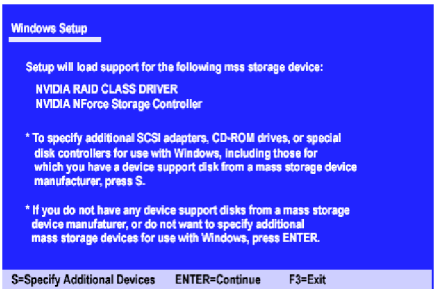

Windows Setup
You have chosen to configure a SCSI Adapter for use with Windows, using a device support disk provided by an adapter manufacturer.
Select the SCSI Adapter you want from the following list, or press ESC to resutrn to the previous screen.
NVIDIA RAID CLASS DRIVER
NVIDIA NForce Storage Controller
Enter=Select F3=Exit

Important

Please follow the instruction below to make an nVIDIA Serial ATA RAID driver for yourself.

1. *Insert the MSI CD into the CD-ROM drive.*
2. *Click the "Browse CD" on the Setup screen.*
3. *Copy all the contents in the* ***:\Nvidia \System \MCP65 \IDE \WinXP \sataraid*** *to a formatted floppy disk.*
4. *The driver disk for nVIDIA RAID controller is done.*

   (2) Select "NVIDIA RAID CLASS DRIVER" and then press **Enter**.
   (3) Press **S** again at the Specify Devices screen, then press **Enter.**
   (4) Select "NVIDIA NForce Storage Controller" and then press **Enter.** The following Windows Setup screen appears listing both drivers:


Windows Setup
Setup will load support for the following mss storage device:
NVIDIA RAID CLASS DRIVER
NVIDIA NForce Storage Controller
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufaturer, or do not want to specify additional mass storage devices for use with Windows, press ENTER.
S=Specify Additional Devices ENTER=Continue F3=Exit

4. Press **Enter** to continue with Windows XP Installation. Be sure to leave the floppy disk inserted in the floppy drive until the blue screen portion of Windows XP installation is completed, then take out the floppy.
5. Follow the instructions on how to install Windows XP. After Windows XP is completely installed, it is recommended that you install the the RAID management tool.

Important

Each time you add a new hard drive to a RAID array, the RAID driver will have to be installed under Windows once for that hard drive. After that, the driver will not have to be installed.

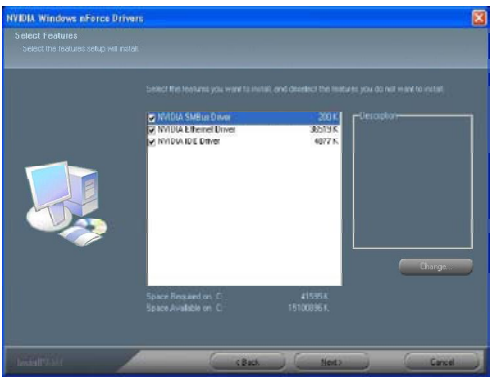
NVIDIA RAID Utility Installation

Installing the NVIDIA RAID Software Under Windows (for Non-bootable RAID Array)

The existing Windows IDE Parallel ATA driver (as well as the Serial ATA driver if SATA is enabled) must be upgraded to use the NVIDIA IDE Parallel ATA driver (as well as the NV Serial ATA driver if SATA is enabled).

This section describes how to run the setup application and install the RAID software which will upgrade the Windows IDE driver and install the RAID software.

1. Start the NVIDIA nForce Drivers installation program to open the NVIDIA Windows nForce Drivers page.



2. Select the modules that you want to install. Make sure that the “NVIDIA IDE Driver” is selected.

Important

You must install the NVIDIA IDE driver in order to enable NVIDIA RAID. *If you do not install the NVIDIA IDE driver, NVIDIA RAID will not be worked.*

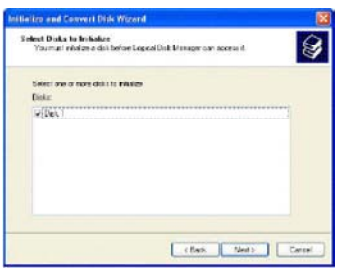
3. Click **Next** and then follow the instructions.
4. After the installation is completed, be sure to reboot the PC.
5. After the reboot, initialize the newly created array.

Initializing and Using the Disk Array

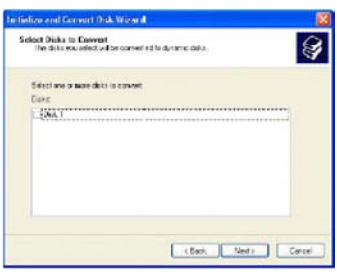
The RAID array is now ready to be initialized under Windows.

1. Launch Computer Management by clicking “Start” --> “Settings” --> “Control Panel” then open the “Administrative Tools” folder and double click on “Computer Management”.
2. Click “Disk Management” (under the “Storage” section). The Initialize and Convert Disk Wizards appears.

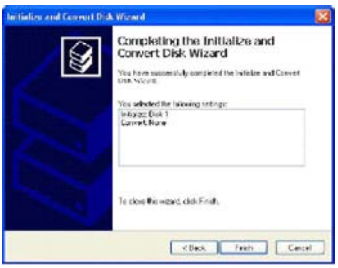
3. Click **Next**. The Select Disks to Initialize window appears. The disks listed depend on how many arrays you have configured.



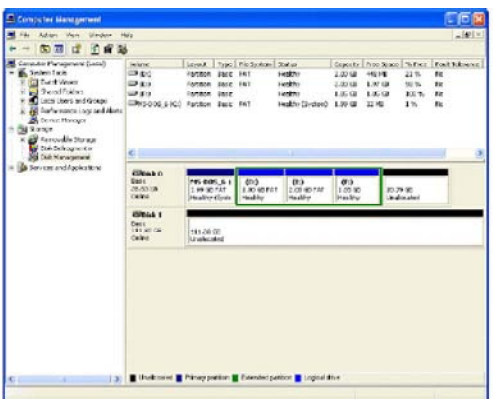
4. Click **Next**. The Select Disks to Convert window appears.



5. Check the disk in the list if you want to make the array a dynamic disk, then click **Next**. The Completing the Initialize and Convert Disk Wizard window appears.



6. Click **Finish**. The “Computer Management” window appears.



The actual disks listed will depend on your system, and the unallocated partition is the total combined storage of two hard disks. You must format the unallocated disk space in order to use it.

7. Format the unallocated disk space. Right click “Unallocated space”, select “New Partition…” and follow the wizard. After the drive has been formatted, it is ready for use.

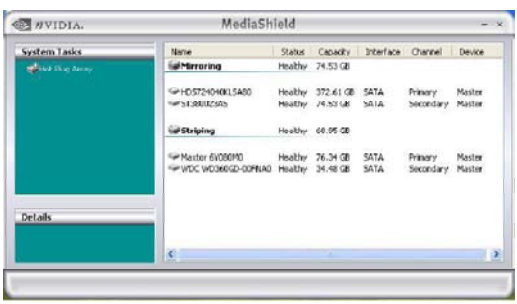
RAID Drives Management

There is an application called NVRAIDMAN which helps you perform the following tasks of nVDIA RAID.

- **Viewing RAID Array Configurations**
  View an array configuration (mirrored, striped, mirror-striped, JBOD, or any supported combination)
- **Setting Up a Spare RAID Disk**
  - View free and/or dedicated free disks
  - Designate a free disk to a particular array
- **Creating RAID Arrays**
- **Deleting a RAID Array**
- **Morphing From One RAID Array to Another**
- **Hot Plug Array**
- **Initializing a RAID Array**
  - Erase the data on the array by writing all zeros to the sectors of each hard disk.
- **Rebuilding a RAID Mirrored Array**
  - Rebuild a broken mirrored array
  - Watch the progress of rebuilding an array
  - Only applies to RAID 1, RAID 0+1, and RAID 5 arrays
- **Synchronizing a RAID Array**
  - Rebuild the redundancy in RAID 1 or RAID 0+1 arrays (copy the data to the redundant disk—the same operation as rebuilding)
  - Rebuild the parity in RAID 5 arrays

Viewing RAID Array Configurations

To view your RAID configuration from Windows, launch the NVRAID Management utility by double-clicking NvRaidMan.exe.
The RAID configuration information appears in the right-side pane, as shown below.



Important

The information in the figures in this part may very from what it is shown in your system.

Setting Up a Spare RAID Disk

You can designate a hard drive to be used as a spare drive for a RAID 1, RAID 0+1 or RAID 5 array. The spare drive can take over for a failed disk. NVRAID supports two types of spare drives:

• Free Disk

A free disk is a disk that is not part of any RAID array, but can be used by any available RAID 1 or RAID 0+1 array that requires a particular disk when one of its disks crashes or becomes unusable. The process is automatic and doesn't require any user interaction.

For example, if you have a system with four hard disks where one disk is used to boot the OS, two hard drives are set up in a mirrored array, and a fourth hard disk is set up as a free disk, then if one of the mirrored array drives fails, the free disk will be automatically assigned to the mirrored array to be used instead of the failed disk.

• Dedicated Disk

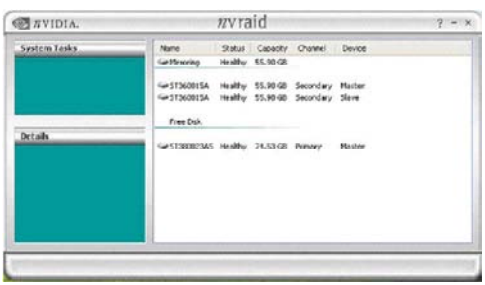
A dedicated free disk is a disk that is assigned to a RAID 1, RAID 0+1 or RAID 5 array and that disk is used by that array only when needed, for example during a system crash where a RAID mirrored drive is broken. The dedicated disk can be used only by the array that it is assigned to and not by any other array, unlike a free disk which can be used by any available RAID 1, RAID 0+1 or RAID 5 array.

Note: You must have at least two RAID arrays to use this feature.

Assigning a Free Disk

To mark a disk as free, or not a part of any array,

1. Enter the system BIOS setup and make sure that the drive that you want to mark as free is RAID enabled.
2. Enter the RAID BIOS and make sure that the drive is not part of any array (if one exists).
3. Boot into Windows and run the NVRAIDMAN program. The drive appears under the Free Disk section. The figure below shows an example of the NVRAIDMAN display if you have a mirror array and one free disk.



Assigning a Dedicated Disk
To mark a disk as dedicated, or reserve it for use by a specific array,

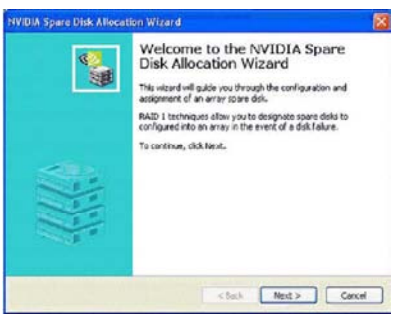
Step 1: Mark the Disk as a Free Disk
1. Enter the system BIOS setup and make sure that the drive that you want to mark as free is RAID enabled.
2. Boot into Windows and run the NVRAIDMAN program.

If the disk is not part of any RAID array, then it will appear under the Free Disk section of the RAID GUI.

Step 2: Dedicate the Free Disk to an Array
While running NVRAIDMAN, dedicate the free disk to an array by doing the following:

1. Right click one of the two Mirrored arrays as shown below.

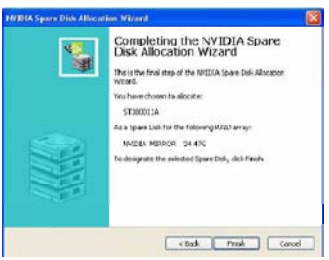
2. Select **Designate Spare** from the menu to launch the Spare Disk Allocation Wizard.


NVIDIA Spare Disk Allocation Wizard
Welcome to the NVIDIA Spare Disk Allocation Wizard
This wizard will guide you through the configuration and assignment of an array spare disk.
RAID 1 techniques allow you to designate spare disks to configured into an array in the event of a disk failure.
To continue, click Next.
< Back
Next >
Cancel

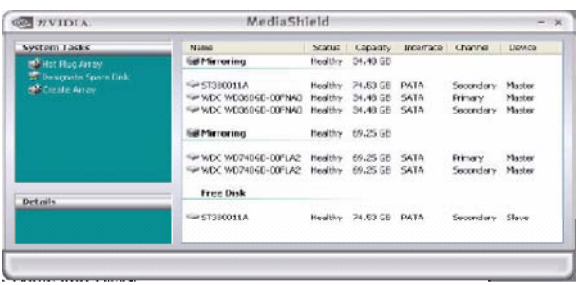
3. Click **Next**.
The RAID Array Selection page appears.

4. From the Free Disk Selection page, select one of the two free disks available. This would be the disk that will be designated to the mirror array.

5. Click **Next**.
The Completing the NVIDIA Spare Disk Allocation page appears.



6. Click **Finish**.
As shown in figure below, the ST380011A drive is now a dedicated free disk in the mirrored array. If a system crash occurs that causes any of the two WD360GD drives to fail, the ST380011A hard drive will take over and be used in the newly formed mirrored array.



Removing a Dedicated Disk

Once a dedicated disk has been assigned to a particular array, it can be removed at any time. To remove the disk, right click on the dedicated disk and select “Remove Disk...” to remove it. In the previous example, simply right click on the ST380011A drive and select “Remove Disk...”. as shown in the screen shot below:

Morphing From One RAID Array to Another

In a traditional RAID environment, when a user wants to change the current state of a disk or a current array to a new RAID configuration, the process of reconfiguring the new array involves multiple steps. The user must back up the data, delete the array, re-boot the PC, and then reconfigure the new array.
NVIDIA RAID allows the end user to change the current state of the disk or array to another with a one-step process called .Morphing.. This section describes the NVIDIA Morphing process and explains how to use Morphing to convert from one RAID array type to another.

General Morphing Principles

NVIDIA RAID includes extensive support for morphing, a process of converting from one RAID mode to another RAID mode.

General Requirements and Limitations

• The new array capacity must be equal to or greater than the previous array.
For example, it is possible to morph from a RAID 1 array to a RAID 0 array as long as the RAID 0 array is the same size as (or larger than) the RAID 1 array.
• You can't morph
- To or from a JBOD (Spanning) array
- From RAID 1 to RAID 1
- From RAID 0+1 to RAID 1
- From RAID 5 to 1

Specific Morphing Requirements

The following table lists the disk requirements for a new RAID array for various morphing combinations.

From	To	New Array Disk Requirements
RAID 0	**RAID 0**	m > n Number of disks in the new array must be greater than the original array.
	RAID 1	m =2, n =1 RAID 1 array must include two disks, converted from a one disk RAID 0 array.
	RAID 0+1	m >= 2 x n Number of RAID 0+1 disks must be equal to or greater than twice the number of RAID 0 disks.
	RAID5	m >= n+1
RAID 1	**RAID 0**	No additional restrictions.
	RAID 1	**** Not a valid combination ****
	RAID 0+1	No additional restrictions.
	RAID 5	m >= 3

From	To	New Array Disk Requirements
RAID 0+1	RAID 0	m >= n2 Number of RAID 0 disks must be equal to or greater than half the number of RAID 0+1 disks.
	RAID 1	** Not a valid combination **
	RAID 0+1	** Not a valid combination **
	RAID 5	m >= (n/2 + 1)
RAID 5	RAID 0	m >= n - 1
	RAID 1	** Not a valid combination **
	RAID 0+1	m >= 2 x (n -1) ; where m is an even number of disks.
	RAID 5	m >= n

Hot Plug Array

With respect to RAID, hot plugging is the ability to add a disk to a system safely and without causing problems for the RAID software. For example, when a drive in a mirrored array fails, the user can launch the Hot Plug Array Wizard which instructs the user as to when a drive can be safely added to the system. As soon as the drive is added, the user can then finish running the RAID wizard and the drive becomes usable by the system. Hot Plug Array allows the user to add or remove an entire array without degrading the array in the process.

NVRAIDMAN can be used to hot plug a RAID disk. To hot plug a disk, simply do the following:

1 Launch NVRAIDMAN and click on “Hot Plug Array” and the following screen shot will appear:

2 Click **Nex**t and the following screen shot will appear:

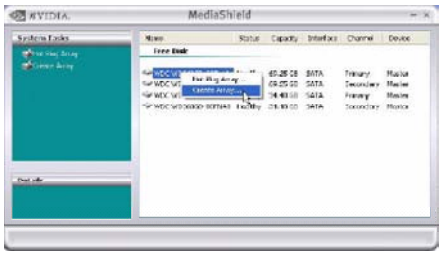
3 Connect the RAID disk that you want to use with any given RAID array.
4 Click **Next** and the following screen shot will appear:

5 Click **Finish**.

Initializing a RAID Array

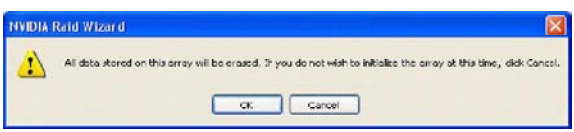
Initializing a RAID array erases all the data that is stored on that array, and writes all zeros to the disks. Initialization of newly configured RAID arrays is recommended to ensure consistency and reliable performance on any supported fault tolerant array such asRAID 5, RAID 0, and RAID 0+1. Use this feature only if you are absolutely sure that you want to wipe out all the data on *that array*.
Initialization of a fault tolerant array can only be done when the array is being created. To initialize an array, perform the following steps:
Note: In this example, a mirror array is initialized.

1 From the NVRAIDMAN window, right click on any available free disk and select **Create Array** as show in Figure below.

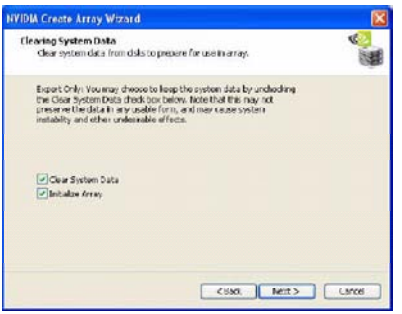


2 The Create Array Wizard opens. Follow the Wizard to create a Mirror array.
3 At the Create Array Wizard Welcome screen, click **Next**.
4 At the RAID Array Selection page, make sure that RAID Mode is set to "**Mirroring**" and Stripe Size is set to its default value of 64K, then click **Next**.
5 At the Free Disk Selection page, select the two drives that you want to Mirror and click **Next**.
6 Click **Next** again and the following screen shot will appear:

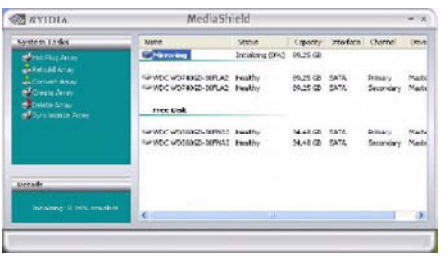
7 Check "Intialize Array" and then click **Next**. The Initialization Warning dialog appears.


NVIDIA Raid Wizard
All data stored on this array will be erased. If you do not wish to initialize the array at this time, click Cancel.
OK
Cancel

8 Click **OK**. The Clearing System Data screen appears again with the Initialize Array check box checked as shown below.


NVIDIA Create Array Wizard
Clearing System Data
Clear system data from disks to prepare for use in array.
Export Only: You may choose to keep the system data by unchecking the Clear System Data check box below. Note that this may not preserve the data in any usable form, and may cause system instability and other undesirable effects.
Clear System Data
Initialize Array
< Back
Next >
Cancel

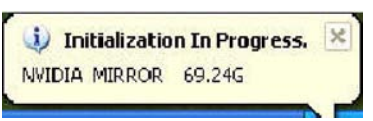
9 Click **Next**, then click **Finish** at the Completing the NVIDIA Create Array Wizard screen. The NVRAIDMAN windows shows the created RAID array as shown below.



The Initialization Process

As you can see from the screen shot above, the initialization process has started and it will be completed in a short period of time. As soon as the Initialization process starts, a popup window similar to the following will appear:

followed by the following pop-up window:

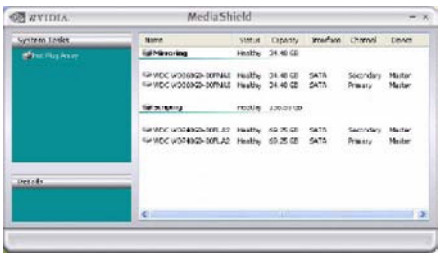


Rebuilding a RAID Array

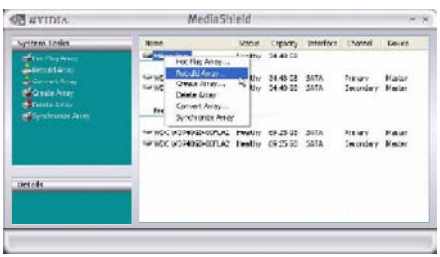
Rebuilding is the process of restoring data to a hard drive from other drives in the array. This applies only to fault tolerant arrays such as RAID 1, RAID 0+1, as well as a RAID 5. For example, assuming you have a three disk RAID 5 array, and one of the drives fail, then you need the lost data on the newly added drive.

Rebuilding Instructions

After creating a mirrored array, you can rebuild the array using the following steps:
1. Go to Windows and run the NVIDIA RAID Management utility.
The picture below shows an example of a system with one mirrored array and two free disks.



2. Right-click on Mirroring. The popup menu appears.



3. From the popup menu, click **Rebuild Array**. The NVIDIA Rebuild Array Wizard appears.

NVIDIA Rebuild Array Wizard
Welcome to the NVIDIA Rebuild Array Wizard
This wizard will guide you through assigning a new disk into an existing RAID array.
The NVIDIA RAID solution allows you to rebuild a new mirrored data copy while the system is up and running, without disrupting user and application access to the data set.
Rebuilding an array can take up to a day to complete. This operation occurs in the background and will not impede your work. If you need to shutdown the computer, the rebuild will continue where it left off when you restart.
To continue, click Next.
< Back
Next >
Cancel

4. Click **Next.** The Disk Selection page appears.

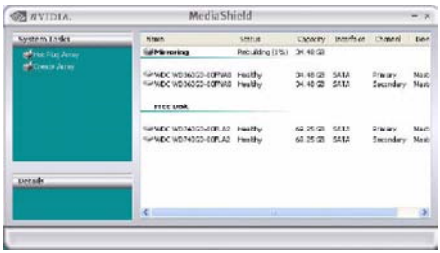
5. Select the drive that you want to rebuild by clicking it from the list, then click **Next**. The Completing the NVIDIA Rebuild Array page appears.

NVIDIA Rebuild Array Wizard
Completing the NVIDIA Rebuild Array Wizard
You have successfully completed the NVIDIA Rebuild Array Wizard
You have chosen to rebuild the following disk:
In the following RAID array:
NVIDIA MIRROR 34.47G
To close this wizard and begin rebuilding the disk, click Finish.
< Back
Finish
Cancel

6. Click **Finish**. The array rebuilding starts after a few seconds, and a small pop-up message appears towards the bottom right corner of the screen as shown in the figure below.

When the rebuilding process is finished you will see the pop up box shown in Figure below.

During the rebuilding process, the NVRAID Management utility screen shows the status under the System Tasks and Details sections.



More About Rebuilding Arrays

• Rebuilding Occurs in the Background

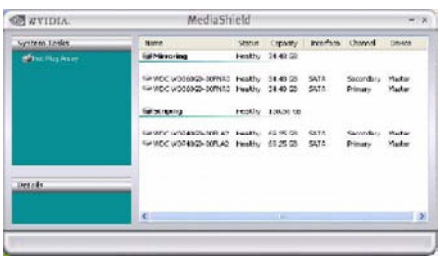
The rebuilding process is very slow (it can take up to a day) and occurs in the background so as not to affect the performance of the system.

• Rebuilding Applies Only to RAID 1/ RAID 0+1 or RAID 5 Arrays

Rebuilding an array works only when using RAID 1 , RAID 0+1, or RAID 5. Rebuilding does not apply to RAID 0 and JBOD arrays.

• Rebuilding applies to a degraded fault tolerant array

You can rebuild a degraded mirrored array using any available Free Disk or Dedicated Disk. For example, Figure below shows a mirrored array using two 34.48 GB drives while having two Free Disks each 55.90 GB large.



To use one of these available free disks to rebuild your array, follow the same steps as explained in “Rebuilding a RAID Array” on p.B-22, except when prompted to select a disk, choose one of the two available free disks.

Synchronizing a RAID Array

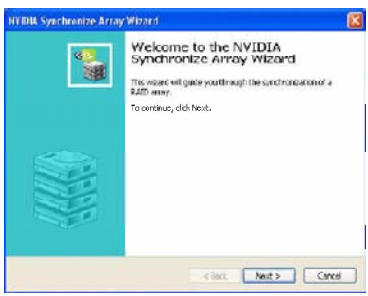
Synchronizing an array will force a rebuild of redundancy or parity. The operation is applicable to any fault tolerant array such as RAID 1, 0+1 and RAID 5.

- For RAID1 and RAID 0+1, “sync” results in copying the data to the redundancy disk,
- For RAID 5, “sync” results in rebuilding the parity

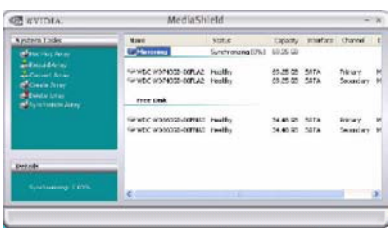
To sync an array, do the following (This example assumes you have already created a fault tolerant array such as RAID 1):

1. Right click on “Mirroring” and select **Synchronize Array** as shown in Figure below.

2. The Synchronize Array Wizard Welcome screen appears.



3. Click on **Next** and then click **Finish** at the Wizard Completion screen. The NVRAIDMAN window indicates that the array is synchronizing, as shown in Figure below.



As you can see from the screen shot above, the synchronization process has started and it will be completed in a short period of time.

Appendix C
nVidia System Driver

MSI provides a setup CD along with your mainboard, which contains the required drivers for your system, and many other useful and powerful utility to bring you the best experience for your office professional working and for your home leisure entertainment.

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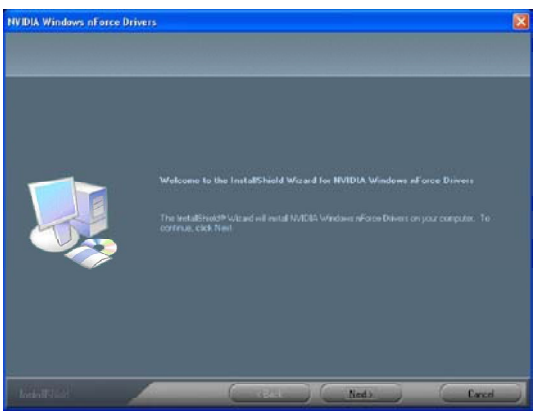
nVidia System Driver Installation

Click on the **Driver** tab and the screen below will display.

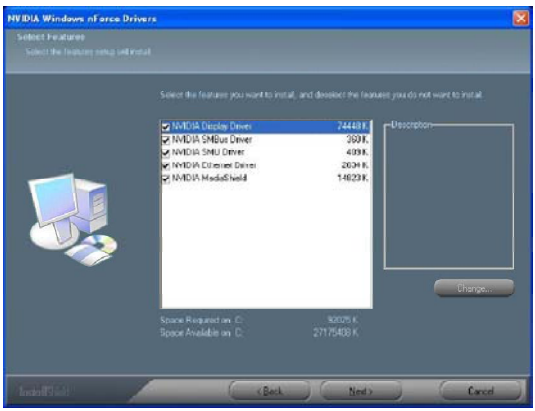
NVIDIA System Driver

This driver is only available for Windows 2000 and Windows XP operating system. Please follow the following step to install the driver correctly.

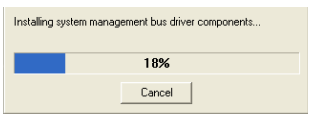
1. Click on the **NVIDIA MCP68 System Driver** button to install the NVIDIA System Drivers for your Windows OS. Then the welcome dialogue will display. Click **Next** to continue.


NVIDIA Windows nForce Drivers
Welcome to the InstallShield Wizard for NVIDIA Windows nForce Drivers
The InstallShield® Wizard will install NVIDIA Windows nForce Drivers on your computer. To continue, click Next
< Back
Next >
Cancel

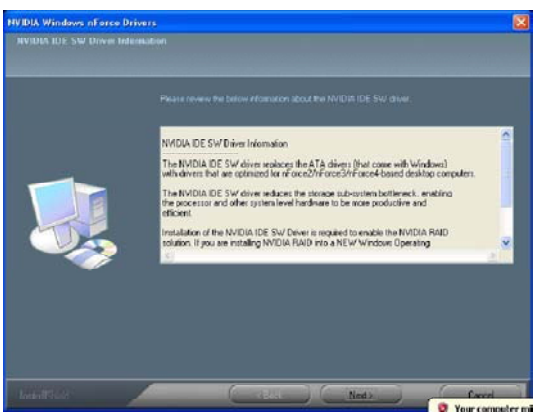
2. Then the following screen displays the available components to install. All the components shown here will be selected to be installed by default. Then click **Next**.



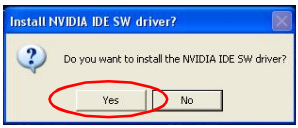
3. The system will start installing the selected driver components automatically.



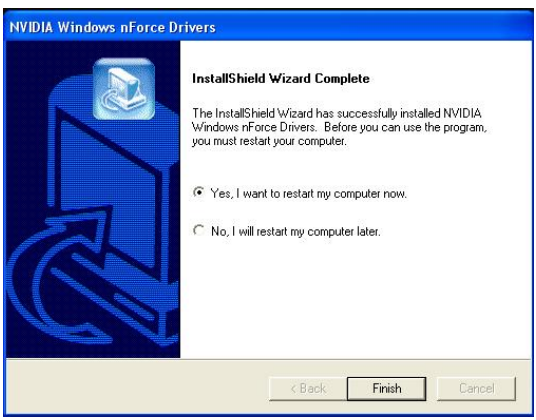
4. Then the following screen displays the information for the NVIDIA IDE SW Driver installation. Click **Next** to continue.


NVIDIA Windows nForce Drivers
NVIDIA IDE SW Driver Information
Please review the below information about the NVIDIA IDE SW driver.
NVIDIA IDE SW Driver Information
The NVIDIA IDE SW driver replaces the ATA drivers (that come with Windows) with drivers that are optimized for nForce2/nForce3/nForce4-based desktop computers.
The NVIDIA IDE SW driver reduces the storage sub-system bottleneck, enabling the processor and other system level hardware to be more productive and efficient.
Installation of the NVIDIA IDE SW Driver is required to enable the NVIDIA RAID solution. If you are installing NVIDIA RAID into a NEW Windows Operating
< Back
Next >
Cancel

5. Then the following screen displays the installation of NVIDIA IDE SW Driver. Click **Yes** to continue.



6. The following screen indicates that the installation is complete. Click **Yes** to restart your computer or click **No** to restart it later.


NVIDIA Windows nForce Drivers
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed NVIDIA Windows nForce Drivers. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
< Back
Finish
Cancel

nVidia Utility Installaion

1. Click on the **Utility** tab and the screen below will display.

2. Then click on the **NVIDIA Utility** tab and the screen below will display.

3. Click the nTune Utility icon to install it.

nTune Utility - provides a safe and easy way to optimize PC performance.

Appendix D
Dual Core Center

Dual Core Center, the most useful and powerful utility that MSI has spent much research and efforts to develop, helps users to monitor or configure the hardware status of MSI Mainboard & MSI Graphics card in windows, such as CPU/GPU clock, voltage, fan speed and temperature.
Before you install the Dual Core Center, please make sure the system has meet the following requirements:

1. Intel Pentium4 / Celeron, AMD Athlon XP/ Sempron or compatible CPU with PCI Express slot.
2. 256MB system memory.
3. CD-ROM drive for software installation.
4. Operation system: Windows XP.
5. DotNet Frame Work 2.0

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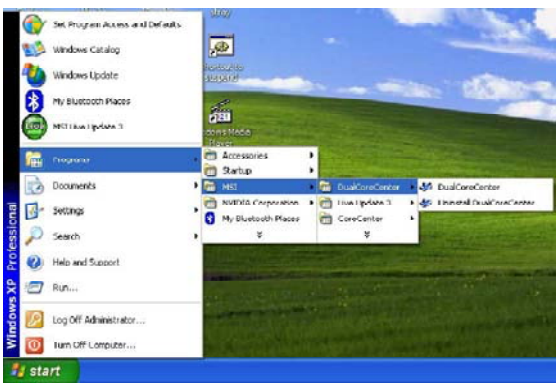
Activating Dual Core Center

Once you have your Dual Core Center installed (locate the setup source file in the setup CD accompanying with your mainboard, path: **Utility --> MSI Utility --> Dual Core Center**), it will have an icon in the system tray, a short cut icon on the desktop, and a short cut path in your "Start-up" menu. You may double-click on each icon to enable Dual Core Center.

short-cut icon in the system tray



short-cut path in the start-up menu (path: Start-->Programs-->MSI--> DualCoreCenter-->DualCoreCenter)

Important

Dual Core Center is for reference only.

Main

Before using this utility, we have to remind you: **only when installing the MSI V044 (V044 has to install with the version 8.26 or newer driver)/ V046 or V060 graphics card can activate the full function of this utility**. If you install a graphics card of other brand, only hardware status of the MSI mainboard would be available.

Introduction:

Click each button appearing above to enter sub-menu to make further configuration or to execute the function.

MB

Click MB button to read current CPU temperature, FSB and CPU clock of mainboard will show below.

VGA

Click VGA button to read current GPU temperature, GPU clock and memory clock of graphics card will show below.

DOT

Click DOT button to enable or disable the Dynamic Overclocking Technology.

AV/ Game/ Office/ Silence/ Cool

MSI provides five common settings for different environments. The settings had been set to optimal values to reach better performance in each environment. Click the button you need.

Important

Before clicking the AV/ Game/ Office/ Silence or Cool button, select Smooth mode or Sharp mode to decide whether you want the system to reach the optimal values smoothly or quickly.

Sharp mode ***Smooth mode***

Clock

In this sub-menu, you can adjust and monitor the clocks of MB and graphics card.

Voltage

In this sub-menu, you can adjust and monitor the voltages of MB and graphics card.

FAN Speed

In this sub-menu, you can adjust and monitor the fan speeds of MB and graphics card.

Temperature

In this sub-menu, you can monitor the temperatures of MB and graphics card.

User Profile

In this sub-menu, you can set the values of clock, voltage and fan speed by your need and save them in a profile. You can save 3 profiles for further use.

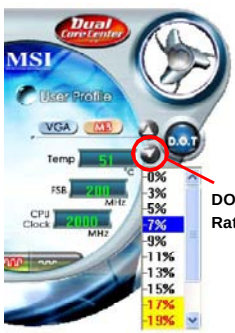
Important

Click on the icon , the clock, voltage, fan, and temperature buttons will appear beside the icon.

DOT (Dynamic OverClocking)

Dynamic Overclocking Technology is an automatic overclocking function, included in the MSI™'s newly developed Dual CoreCenter Technology. It is designed to detect the loading of CPU/ GPU while running programs, and to over-clock automatically. When the motherboard detects that the loading of CPU is exceed the default threshold for a time, it will speed up the CPU and fan automatically to make the system run smoother and faster. When the graphics card detects that the loading of GPU is exceed the default threshold for a time, it will speed up the GPU, memory, fan and voltage automatically to make the system run smoother and faster. When the CPU/ GPU is temporarily suspending or staying in low loading balance, it will restore the default settings instead. Usually the Dynamic Overclocking Technology will be powered only when users' PC runs huge amount of data, like 3D games or video process, and the motherboard/ graphicd card need to be boosted up to enhance the overall performance. There will be several selections when you click the DOT rate button (include increase rate and decrease rate buttons), to select the DOT level, then you have to click the DOT button to apply the DOT function.

DOT FSB-UP
Rate button



DOT FSB-DOWN
Rate button

Important

Even though the Dynamic Overclocking Technology is more stable than manual overclocking, basically, it is still risky. We suggest user to make sure that your CPU can afford to overclock regularly first. If you find the PC appears to be unstable or reboot incidentally, it's better to lower the level of overclocking options. By the way, if you need to conduct overclocking manually, please do not to apply the DOT function.

Clock

In the **Clock** sub-menu, you can see clock status (including FSB/ CPU clock of mainboard and GPU/ memory clock of graphics card) of your system. And you can select desired value for overclocking. There will be several items for you to select for overclocking after you click button. You can click the plus sign button to increase the clock, or click the minus sign button to decrease the clock. And finally, click the Apply button to apply the values adjusted. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.

On the underside, it shows the graphs of the clocks. Only the curves of the item which the button is lit up with red color will be shown.

Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

Voltage

In the **Voltage** sub-menu, you can see voltage status (including Vcore, memory, GPU voltage... etc.) of your system, and you can select desired value for overclocking. It will show several items to select for overclocking after you click the button. You can click the plus sign button to increase the voltage, or click the minus sign button to decrease. And finally, click the Apply button to apply the adjustments. If you do not want to apply the adjustments, click the Cancel button to cancel. Or click the Default button to restore the default values.

On the underside, it shows the graphs of the voltages. Only the curves of the item which the button is lit up with red color will be shown.

Important

*In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

FAN Speed

In the **FAN Speed** sub-menu, you can read fan status of your system. Select higher speed for better cooling effect. There are several sections for you to change the fan speed to a section after clicking button. Click the plus sign button to increase the fan speed to a section, or click the minus sign button to decrease. Or click the Default button to restore the default values.

On the underside, it shows the graphs of the fan speed. Only the curves of the item which the button is lit up with red color will be shown.

Important

1. *When you set the fan speed manually, please make sure to disabled the "CPU Smart FAN Target" item in the BIOS.*
2. *In the user profile, clicking the **Save** button can save the changes to it. In the default profile, the Save button is not available.*

Temperature

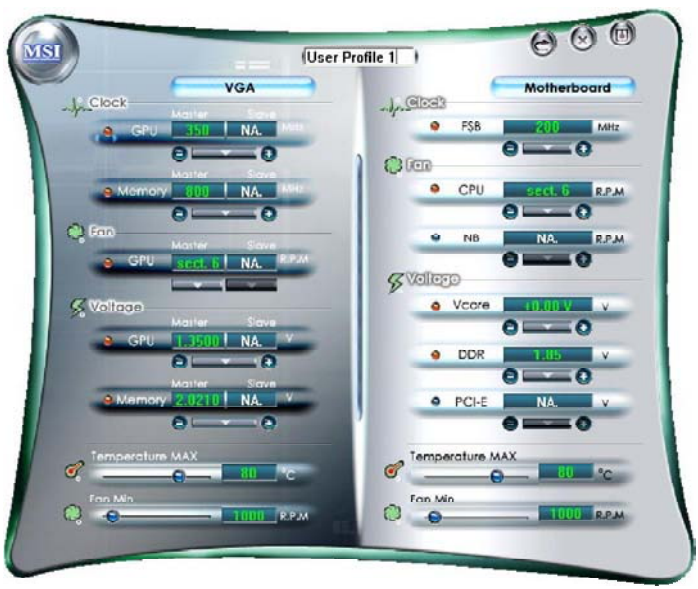
In the **Temperature** sub-menu, you can see temperature status of your system.

On the underside, it shows the graphs of the temperatures. Only the curves of the item which the button is lit up with red color will be shown.

User Profile

In the **User Profile** sub-menu, click the setting button that besides the user profile bar, and the next screen will appear.

Here you can define the clock/ fan speed/ voltage by your need, click the button to choose a value quickly, or click the plus / minus sign button to increase/ decrease the value.



Use the draw bar to set the max system temperature. When the system temperature exceeds the threshold you defined, the system will pop up a warning message and shut down the system.
Use the draw bar to set the minimal fan speed. When the fan speed is lower than the threshold you defined, the system will pop up a warning message.

After setting all values you need, you can change the user profile name in the box then click the save button to save all changes in a profile.

Finally, you can choose the user profile by click the button in the left side and click the Apply button to load the user profile.